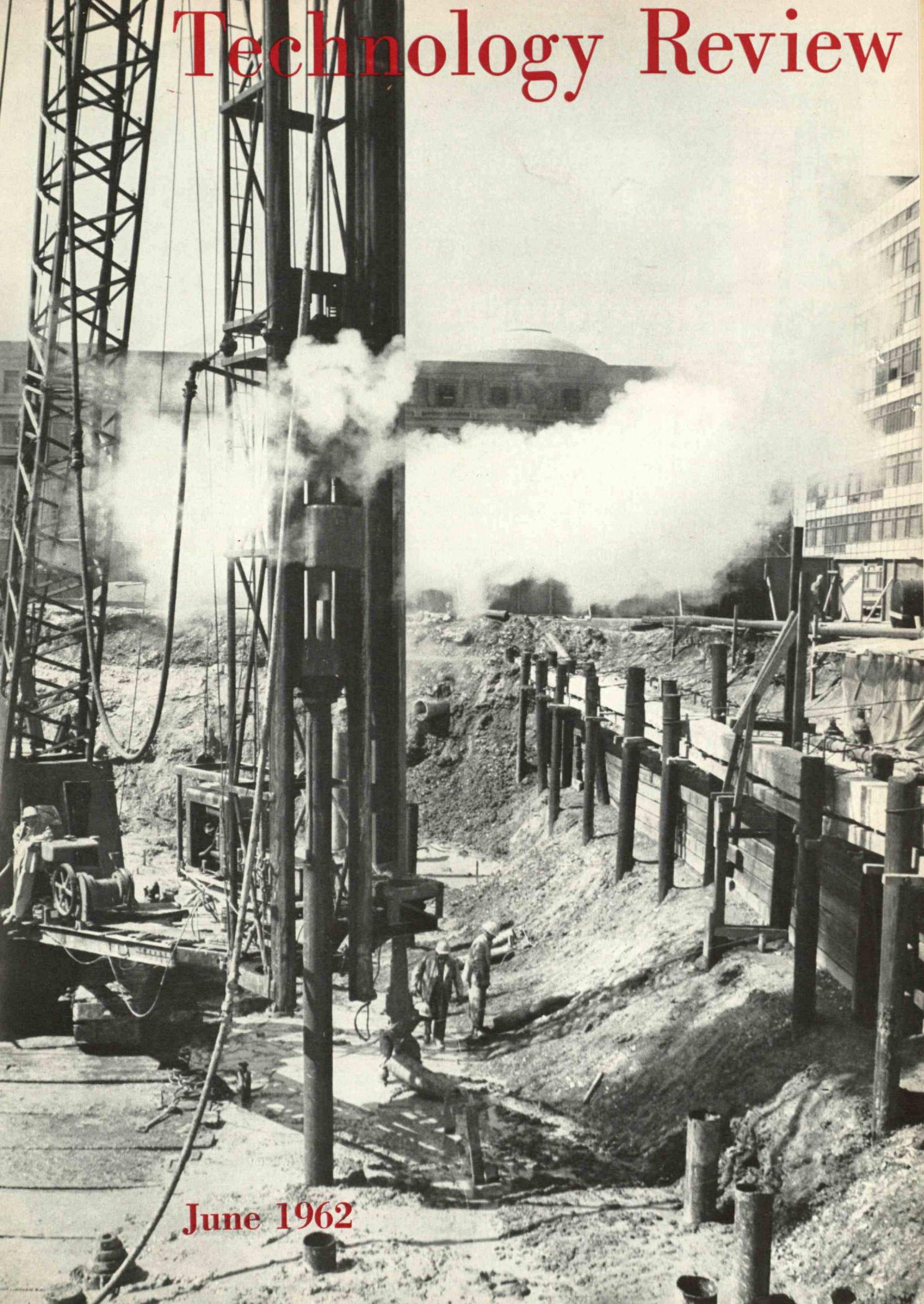


Technology Review



June 1962

technology review

Published by MIT

This PDF is for your personal, non-commercial use only.

Distribution and use of this material are governed by copyright law.

For non-personal use, or to order multiple copies please email
permissions@technologyreview.com.

TODAY'S
MOST RELIABLE
SOLID TANTALUM
CAPACITORS



**HYREL® ST Capacitors, developed and qualified
for use in the Minuteman Missile, are
NOW available to you in ALL RATINGS!**

- Quality *100 times* greater than that of former high-reliability components! That's the ultra-high-reliability now demanded of electronic parts in the Minuteman missile's intricate guidance and control system.
- An unmatched test history of over 129 million unit-hours backs up the design of HYREL ST Capacitors to withstand the rigorous performance requirements specified for Minuteman components.
- The pioneer in solid tantalum capacitors, Sprague is one of 12 nationally-known manufacturers chosen to participate in the

Air Force's Minuteman Component Development Program of Autonetics, a division of North American Aviation, Inc.

- All of the special processes and quality control procedures that make HYREL ST Capacitors the most reliable in the world can now help you in your military electronic circuitry. A tantalum capacitor engineer will be glad to discuss the application of these capacitors to your missile and space projects. Write to Mr. C. G. Killen, Vice-president, Industrial and Military Sales, Sprague Electric Company, 255 Marshall St., North Adams, Mass.

SPRAGUE COMPONENTS

CAPACITORS
TRANSISTORS
MAGNETIC COMPONENTS
RESISTORS
MICROCIRCUITS

INTERFERENCE FILTERS
PULSE TRANSFORMERS
PIEZOELECTRIC CERAMICS
PULSE-FORMING NETWORKS
TOROIDAL INDUCTORS

HIGH TEMPERATURE MAGNET WIRE
CERAMIC-BASE PRINTED NETWORKS
PACKAGED COMPONENT ASSEMBLIES
FUNCTIONAL DIGITAL CIRCUITS
ELECTRIC WAVE FILTERS

SPRAGUE®
THE MARK OF RELIABILITY

'Sprague' and '®' are registered trademarks of the Sprague Electric Co.

TRADE
BRIEFS

We make something for practically everyone



Leadership is not always an unmixed blessing. Take Cabot's case, for instance.

We produce more different grades of carbon black — the raw material principally used to reinforce tires and a host of other rubber products — than anyone else. We sell more. Not only in the U. S. but on all six continents. In no less than 58 different countries, at last count.

Such a record of leadership is most certainly gratifying. But as we mentioned, its blessings are not altogether unmixed. Because some people still say — "Oh yes, Cabot — the carbon black people" . . . just as if Cabot produced only carbon black, and only for the rubber industry!

This (we'll say it as gently as we can) is a mistaken notion. As the headline says, we make something for practically everyone. We offer a wide range of raw materials for industry (including, quite possibly, yours). Any one of them may help you realize a better product . . . a better profit . . . or both.

For Industry, from Cabot:

CARBON BLACK — the world's most complete range . . . more than 50 different grades, each with a specific industrial use.

CAB-O-LITE® (Cabot wollastonite) — as a paint pigment, this versatile, uniform calcium silicate has more desirable properties than other extenders used singly or in combination. Excellent for all types of paint, and for all types of ceramics.

PT® PINE TAR PRODUCTS — these versatile quality controlled materials improve the performance of a wide variety of products, in-

cluding: rubber, paint, cordage, oakum and insecticides.

CAB-O-SIL® — this unique airborne silica, in extremely small amounts, greatly improves an enormous variety of products. Remarkable for its unusual combination of properties, it's equally effective as a thixotropic, thickening, gelling, suspending, flattening, reinforcing, anticaking, and antislip agent. Used in plastics, lubricating oils, greases, paints, varnishes, lacquers, rubber, sulfur, insecticides, pharmaceuticals, cosmetics, and many other products.

OTHER PRODUCTS INCLUDE: CHARCOAL, CHARCOAL BRIQUETS, OIL, NATURAL GAS, NATURAL GASOLINE, LIQUEFIED PETROLEUM GASES, EARTH MOVING EQUIPMENT, PORTABLE WELL DRILLING AND SERVICING EQUIPMENT, OIL FIELD PUMPING EQUIPMENT, STEEL FABRICATION AND GUN TUBES.

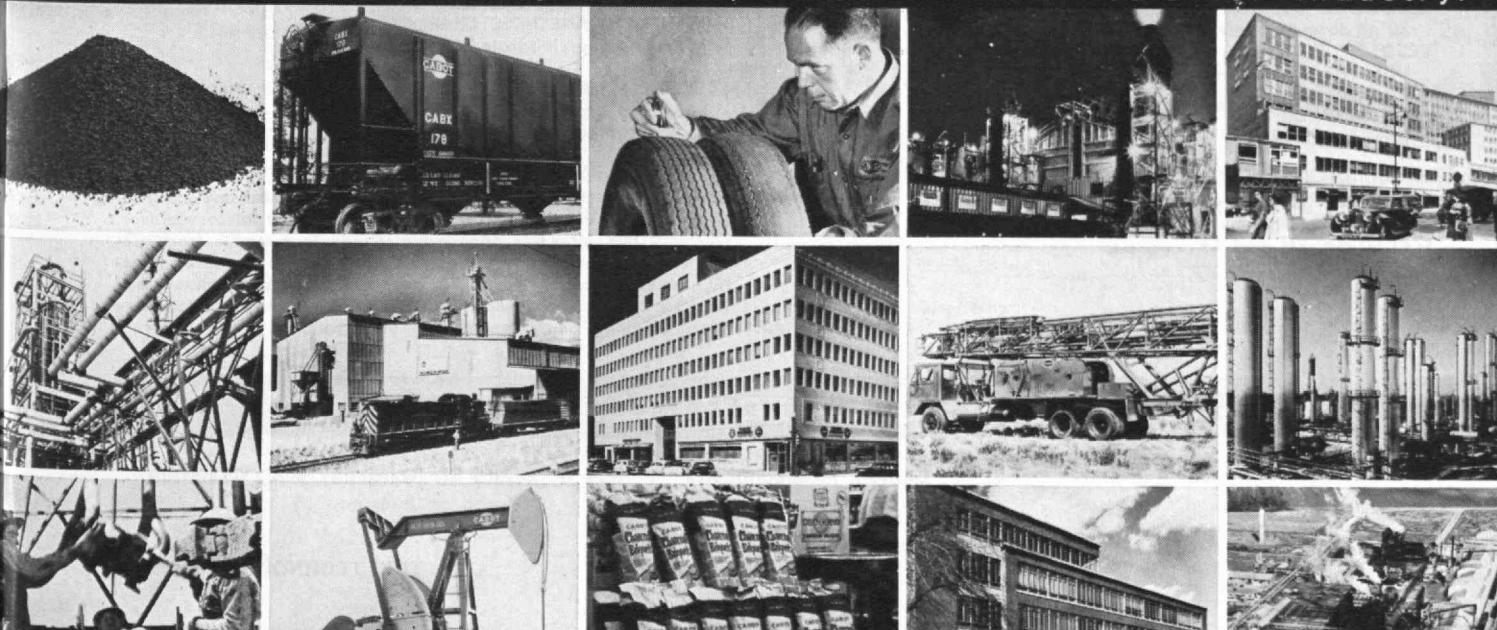
For complete information, phone or write:



CABOT CORPORATION

125 HIGH STREET, BOSTON 10, MASSACHUSETTS

Cabot — an internationally known producer of chemicals for industry.



Microwave Absorber Problem?

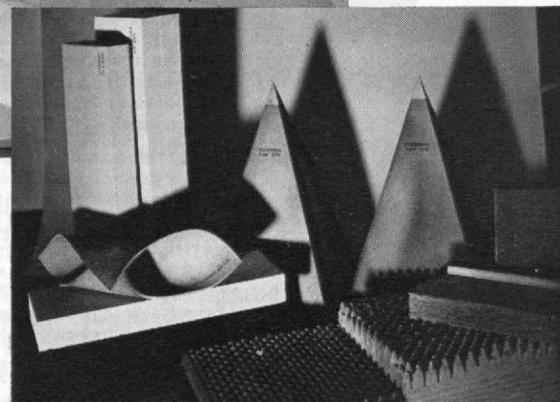
*We'll give you a hand...
or do the whole job...with*

ECCOSORB®



ECCOSORB® A.C. 215 —
Designed and built for
Republic Aviation Corporation.
Better than -40 db
from 200 mc.

Basic building blocks for
"free space chambers".



From do-it-yourself Absorbers to complete ECCOSORB® Anechoic Chambers, leading electronics firms rely on ECCOSORB®. Available as follows:

FREE SPACE ABSORBERS

ECCOSORB® FR

Rigid Foam for Microwave Darkrooms

ECCOSORB® AN

Flexible Foam

ECCOSORB® HT

Ultra High Temperature (1200°F.)

ECCOSORB® CV

40 db down Microwave Absorber

ECCOSORB® CHW

UHF, VHF and Microwave Coverage
for Darkrooms

ECCOSORB® CH

Emmeshed Fiber

TRANSMISSION LINE DIELECTRIC ABSORBERS

ECCOSORB® HF, MF, MF 500 F and LS

Absorber for Waveguide and Coax

ECCOSORB® PM and CR

"Do-it-yourself" Absorbers

COMPLETE READY-TO-USE INSTALLATIONS

ECCOSORB® PANELS and

R.F. SHIELDED ANECHOIC CHAMBERS

Portable and prefabricated for
field testing

ECCOSORB® CAPS

Individual Housings for
Radiating Antennas

ECCOSORB® ANECHOIC CHAMBERS

Completely erected by E/C personnel to satisfy most any electrical requirement, these chambers are designed and built for convenience, efficiency and attractive appearance. Ready to assemble from pre-fabricated panels to any size or shape. Portable. Guaranteed mechanically, electrically to maintain specified ratings. Lighting and ventilation comparable to the finest laboratories. Sturdy, non-reflective floors. Shielding and power filtering also available.

Write for FREE literature on any or all of the above:

Emerson & Cuming, Inc.

Plastics/Ceramics for Electronics

Canton, Massachusetts • 604 W. 182nd St. (Gardena), L.A., California

Technology Review

Reg. U.S. Pat. Off.

Volume 64, Number 8

Edited at the Massachusetts Institute of Technology

June, 1962

Feedback

Whitney and Slavery

FROM ROBERT EVANS, JR., '54:

Professor Woodbury's discussion of Whitney's cotton gin (April, 1962, page 21) was very interesting, but I felt he drew stronger conclusions than seem warranted concerning the strength of its social and economic consequences. A complete discussion of cotton, slavery, and the economic history of the South would be a book. A few specifics, however, may make my position clear. Woodbury links current social problems with the 3.3 million increase in the slave population between 1790 and 1860. Yet 2.7 million of this increase occurs after the close of the foreign slave trade, and thus most of the increase in the Negro population is a natural one which would have occurred even if slavery had been ended earlier. This, coupled with the treatment accorded Free Persons of Color in the North before the Civil War, suggests that many of today's social problems might well have been with us anyway.

Then, too, dividing in half the 60 years of Nineteenth Century slavery, one observes:

1) The first 30 years are characterized by (a) a sixfold increase in cotton production, (b) slave prices which rise about 50 per cent, and (c) a southern indigenous antislavery movement;

2) The second 30 years are characterized by (a) a sixfold increase in cotton production, (b) slave prices which rise by more than 125 per cent, and (c) the identification of slavery as a positive virtue in the southern economy and society.

Given the foregoing, it seems to me that the identification of the states of the Confederacy as synonymous with cotton, slaves, and plantations (an identification quite inappropriate considering their true complexity) is primarily a function of factors somewhat later and more numerous than the invention of the cotton gin in 1793.

South Acton, Mass.

(Concluded on page 6)



MANY CHANGES will be seen under way at M.I.T. on Alumni Day, June 11. This issue is concerned largely with both innovations in educational techniques and construction projects. The Alumni Day program is described on page 27.

EDITOR: Volta Torrey; BUSINESS MANAGER: R. T. Jope, '28; CIRCULATION MANAGER: D. P. Severance, '38; EDITORIAL ASSOCIATES: J. J. Rowlands, Francis E. Wylie, John I. Mattill; EDITORIAL STAFF: Ruth King, Roberta A. Clark; BUSINESS STAFF: Madeline R. McCormick, Patricia Fletcher; PUBLISHER: H. E. Lobdell, '17.

The Technology Review is published monthly from November to July inclusive, on the 27th day of the month preceding the date of issue, by the Alumni Association of M.I.T.; D. Reid Weedon, Jr., '41, President; H. E. Lobdell, '17, Executive Vice-president; Thomas F. Creamer, '40, Carroll L. Wilson, '32, Vice-presidents; Donald P. Severance, '38, Secretary-Treasurer. Copyrighted, 1962, by the Alumni Association of M.I.T.

Office of publication is 10 Ferry Street, Concord, N. H. Editorial and business offices are in Room 1-281, Massachusetts Institute of Technology, Cambridge 39, Mass.

An annual subscription in the U.S. is \$4.00; in Canada and elsewhere, \$4.50; a single copy, 60 cents. Three weeks must be allowed to effect a change of address, for which both the old and the new address should be given.

All correspondence, Editorial and Advertising Matter, Change of Address Notices, Subscription Orders should be addressed to

THE TECHNOLOGY REVIEW
Massachusetts Institute of Technology
Cambridge 39, Massachusetts

POSTMASTER—Undeliverable copies return to The Rumford Press, 10 Ferry Street, Concord, N. H.
Second-class postage paid at Concord, N. H.
PRINTED IN USA

Contents

The Cover

The big noise at M.I.T. this spring has been that of pile drivers working at the site of the new Earth Sciences Building. Bob Lyon of M.I.T.'s Photo Service provided the cover and many other photos for this issue.

Individuals Noteworthy 4

The first Ford Professors are named and M.I.T.'s Alumni elect officers.

Index to Advertisers 12

The Trend of Affairs 19

Satellite TV transmission begins . . . and biologists report new findings.

Parking Problems Solved 24

The unicycle stages an impressive comeback in Cambridge.

Protest from the Particles 25

Paul Steranka, '60, writes about the Science Teaching Center from an unusual point of view, shared by illustrator Henry B. Kane, '24.

Models Aid Builders 28

Robert J. Hansen, '48, and William A. Little, '57, explain the significance and methods of a new engineering laboratory.

Our New Kind of Evolution 31

John Pfeiffer reviews recent advances in computer technology and stresses their long-run significance.

Books 34

Institute Professor Cyril S. Smith, '26, reviews Dr. Teller's new book.

Ingenuity: Quality of Victory 35

Luis de Florez, '11, recalls some of his own experiences.

A Computer's Sketches 37

An M.I.T. student produces novel designs by data-processing equipment.

Parents See What Goes On 38

The Institute is host to 1400 visitors on a busy weekend.

Institute Yesteryears 52

Items that were news at M.I.T. 25, 50, and 75 years ago.

Individuals Noteworthy

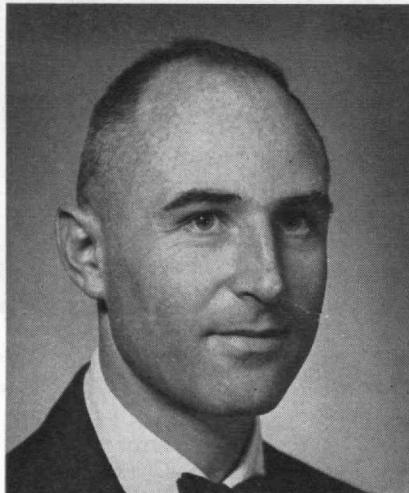
The Institute Appoints Five Ford Professors

FIVE of seven endowed chairs made possible by the Ford Foundation's grant to M.I.T. in 1959 were filled this spring by appointments from the Institute's Faculty. The occupants are the men pictured at the right and below.

Dean Gordon S. Brown, '31, noted that they were chosen after an exhaustive survey of possible candidates elsewhere, that each already has contributed to advances in engineering education, and that all are especially qualified to provide leadership in the development of interdisciplinary curricula.



Harold S. Mickley, '46



Ascher H. Shapiro, '38



David C. White



Morris Cohen



Robert M. Fano, '41

The Association Elects New Officers

IN THE balloting that ended April 25, the M.I.T. Alumni Association elected *William L. Taggart, Jr., '27*, as its President for one year; *F. Leroy Foster, '25*, as Vice-president for two years; and *George J. Schwartz, '42*, and *Howard L. Richardson, '31*, as Executive Committeemen for two years.

The Association's nominees for term membership on the M.I.T. Corporation are: *Theodore A. Mangelsdorf, '26*, *Frank R. Milliken, '34*, and *D. Reid Weedon, Jr., '41*.

To fill three vacancies on the National Nominating Committee, *Franklin E. Penn, '40*, was elected from District 8; *Earl L. Bimson, '43*, from District 9; and *Gaynor H. Langsdorf, '32*, from District 10.

Astronaut from M.I.T.

ONE OF EIGHT men chosen in April for training for future space projects was Lieutenant Commander Lloyd N. Hoover, '56, a test pilot at the Patuxent River Naval Air Test Center in Maryland. He will begin training this month at Edwards Air Force Base.

M.I.T.'s first astronaut is married and has two children. His parents live in Wilbraham, Mass. He studied at the Institute for two years before being appointed to the U.S. Naval Academy at Annapolis, and returned to the Institute later to receive his master's degree in nuclear engineering.

Further Recognition

CHAIRMAN JAMES R. KILLIAN, JR., '26, of the M.I.T. Corporation has been elected to the Massachusetts Board of Education. . . . New members of the National Academy of Sciences include *John Machlin Buchanan*, Professor of Biochemistry, and *Chia-Chiao Lin*, Professor of Mathematics. . . . Institute Professor, Emeritus, *C. Richard Soderberg, '20*, is now an educational consultant to the U.S. Military Academy's Academic Board.

Naval Honors

REAR ADMIRAL Ralph K. James, '33, presented Secretary of Navy Awards to Captain Edward S. Arentzen, '43, and Captain Lewis A. Rupp (Ret.), '43, in a ceremony at the Institute in April.

(Continued on page 10)

"CHARGED PARTICLES"

High Energy Hardware

The Van de Graaff long ago earned its place in the nuclear physics laboratory. The electrostatic accelerator had apparent voltage limitations, and the Company that came to build them for research appeared to accept these limitations and settled down happily in the field of low energy physics. Perseverance in technology and the Tandem principle of charge-exchange tend to make these limitations less apparent today, but we still speak mainly of low energy or "nuclear structure" physics research.

Injection

What about our interest in high-energy physics? Visible accomplishments of High Voltage Engineering include the design and delivery of thirteen injectors to accelerators in the Gev range, mostly electron and proton synchrotrons. These are listed at right. The results are gratifying. For instance, the installations of new ARCO 10-Mev Linac injectors have increased the electron beam intensity of two synchrotrons by several orders of magnitude, significantly improving their usefulness. The Cambridge Electron Accelerator went into operation successfully last month with an ARCO 20-Mev S-Band Linac as injector. Three Van de Graaffs are getting protons off to a good start at Brookhaven National Laboratory, Saclay in France and Princeton University.

High Voltage d-c

On the output end of orbital accelerators, the 600-kilovolt, 8 milliampere ICT* d-c power supply is being used to develop a stable electric field for high energy beam separators or velocity selectors, presently for Brookhaven and Argonne National Laboratories.

High Voltage is our business — for example, sophisticated studies of vacuum as a high-voltage insulating medium are being carried out. We are developing high volt-

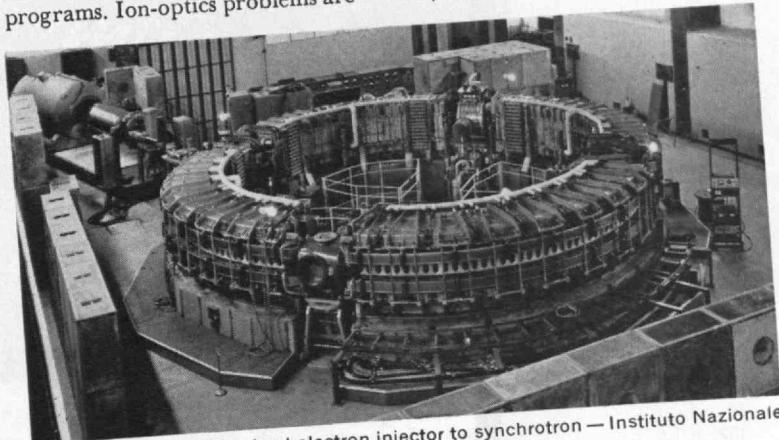
*Insulating-Core Transformer

age transfer systems which will support 750 kv d-c into 10^{-6} Torr vacuum from atmosphere.

Ion Guns

In the development of more intense ion sources, there has been steady progress over the years. One-hundred milliamperes guns are being used in our own research programs. Ion-optics problems are

the subject of constant development with an eye toward higher intensity and better efficiency. Much of this work is a necessary part of our Tandem Van de Graaff program and sheds light on problems we share with designers of high energy accelerator systems. We welcome the opportunity to evaluate these capabilities in terms of your requirements.



3 Mev Van de Graaff pulsed electron injector to synchrotron — Instituto Nazionale di Fisica Nucleare, Frascati, Italy.

INJECTORS FOR HIGH ENERGY ACCELERATOR INSTALLATIONS

University of Purdue	1 Mev Van de Graaff	SYNCHROTRON
Massachusetts Institute of Technology	1 Mev Van de Graaff	340-Mev Electron
CERN	1.5 Mev Van de Graaff	350-Mev Electron
Cornell University	2 Mev Van de Graaff (replaced by 10-Mev Linac)	Electron Analog to Storage Ring
Brookhaven National Laboratory	2 Mev Van de Graaff	1.1 Gev Electron
Instituto Nazionali di Fisica Nucleare de Frascati, Italy	3 Mev Van de Graaff	Analog to 30-Gev Proton
University of Bonn	3 Mev Van de Graaff	1.5-Gev Electron
Princeton University	3 Mev Van de Graaff	416-Mev Electron
Brookhaven National Laboratory	4 Mev Van de Graaff	3-Gev Proton
Centre d'Etudes Nucleaires de Saclay	4 Mev Van de Graaff	3.5-Gev Proton
Cornell University	10 Mev Linac	1.1-Gev Electron
California Institute of Technology	10 Mev Linac	1.5-Gev Electron
Cambridge Electron Accelerator	20 Mev Linac	6-Gev Electron

HIGH VOLTAGE ENGINEERING
BURLINGTON, MASSACHUSETTS, U.S.A.
APPLIED RADIATION CORPORATION
HIGH VOLTAGE ENGINEERING (EUROPA) N.V.





Increased technical responsibilities in the field of range measurements have required the creation of new positions at the Lincoln Laboratory. We invite inquiries from senior members of the scientific community interested in participating with us in solving problems of the greatest urgency in the defense of the nation.

■ RADIO PHYSICS and ASTRONOMY ■ RE-ENTRY PHYSICS ■ PENETRATION AIDS DEVELOPMENT ■ TARGET IDENTIFICATION RESEARCH ■ SYSTEMS: Space Surveillance, Strategic Communications, Integrated Data Networks ■ NEW RADAR TECHNIQUES ■ SYSTEM ANALYSIS ■ COMMUNICATIONS: Techniques, Psychology, Theory ■ INFORMATION PROCESSING ■ SOLID STATE Physics, Chemistry, and Metallurgy ■ *A more complete description of the Laboratory's work will be sent to you upon request.*

All qualified applicants will receive

consideration for employment without regard to race, creed, color or national origin.

Research and Development
LINCOLN LABORATORY 
Massachusetts Institute of Technology • Box 28
LEXINGTON 73, MASSACHUSETTS

Feedback

(Concluded from page 3)

Memories of Professor Prescott

FROM ELLIOTT KING SHAPIRA:

Although never a student at M.I.T., I was privileged to know Professor Prescott and his family since I was a young boy living in his neighborhood in Brookline.

For the last 11 years, with a comparatively added maturity, I have been his neighbor at 100 Memorial Drive. During this time, his friendship, kindness, and understanding were always appreciated. His great sense of humor and skill and knowledge in literary affairs were likewise most meaningful to me.

Certainly Professor Prescott was highly loved and respected by many people, but I remember with particular fondness his early thoughtfulness to a boy in Brookline and his continued esteem for all human beings.

Tufts University, Medford, Mass.

Regarding Institute Yesteryears

FROM CHARLES H. CARPENTER, '12:

I'm not one for writing in to publications; in fact, this is my first experience, but your article on page 35 of the March Review brings to mind a story.

Whether true or a newspaper story, I can't say, but this story is attributed to Mrs. MacLaurin: On being urged to divulge the name of the [anonymous] donor, she said, "Oh, yes, you take 'sh' which means hush; divide it, and put M.I.T. between; and there you have it—S-M.I.T.-H."

Bayport, Long Island, N.Y.

When Edison Advertised

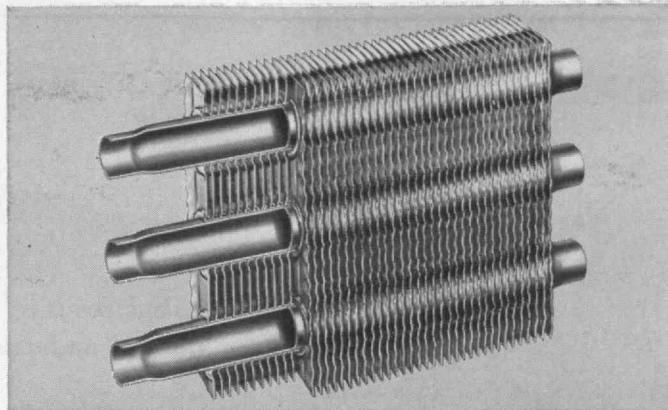
FROM ALLEN F. BREWER, '13:

I was quite interested to note on page 32 of the April, 1962, issue of Technology Review, that a new edition of "Concerning the Massachusetts Institute of Technology" was in progress [50 years ago].

Some 50 years ago I participated in what I believe was the second edition, in the capacity of Business Manager. At the same time E. B. Germain, '13, was Editor in Chief. My responsibility was to obtain advertisements. To this end, as a resident of West Orange, N.J., and fellow-townsman of Thomas A. Edison, I presumed to write to the noted inventor extolling the virtues of "Concerning the M.I.T."

One of my treasured archives of those undergraduate days is a letter from his advertising manager, dated June 8, 1912, authorizing a full-page advertisement by direction of Mr. Edison.

Jensen Beach, Fla.



HIGHEST EFFICIENCY... TOP PERFORMANCE



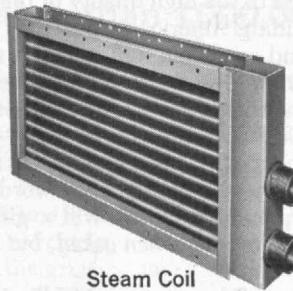
Highest efficiency and top performance are the reasons why more McQuay Hi-F coils are used to solve unusual heat transfer problems than any other brand. It is not surprising. The famous rippled fin (with full fin collars) and staggered tube construction of McQuay Hi-F coils provides maximum heat transfer, greater strength and the longest trouble-free performance. McQuay Hi-F coils are available in the widest range of materials including copper, aluminum, stainless steel, steel, admiralty metal, monel, nickel and red brass. Hi-F coils are supplied in one or more

rows deep, one to 15 fins per inch, and with 5/16", 3/8", 1/2", 5/8", and 1" tube diameters for steam, hot water, chilled water, direct expansion, or special fluids and atmospheres. For the fabrication of coils for special applications, from research through engineering to precise, quality-controlled production, McQuay has more coil experience than anyone in the industry. For the benefit of that experience, see your McQuay representative... or write to McQuay, Inc., 1601 Broadway N.E., Minneapolis 13, Minnesota, for more information.

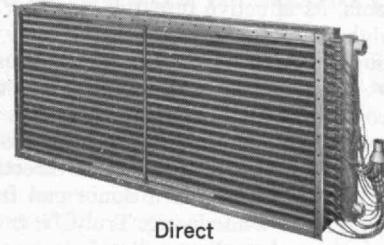
FOR EVERY HEATING AND COOLING APPLICATION



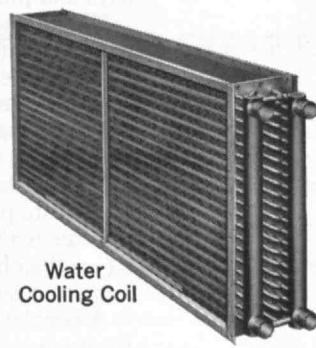
Water Heating Coil



Steam Coil



Direct Expansion Coil



Water Cooling Coil



B. E. JAMES '32, President
JOHN A. MOGA, JR. '57
WILLIAM H. BUTCHER '59

MANUFACTURING PLANTS AT FARIBAULT, MINNESOTA • GRENADA, MISSISSIPPI • VISALIA, CALIFORNIA



and the prophet replied:

*"It is well to give when asked, but it is
better to give unasked, through understanding."* *

Gifts by Will

TO THE

Massachusetts Institute of Technology

The tale is told of Almustafa, the prophet, who, having awaited for many years the ship that would return him to the place from whence he came, was making the final descent to the shore when the folk of Orphalese crowded about him. They besought him before departing to "disclose us to ourselves, and tell us all that has been shown you of that which is between birth and death."

With words of wisdom, an answer appropriate was given to the woman holding a baby, to the ploughman, to the merchant. Begged one, "Speak to us of GIVING," and the prophet replied:

"It is well to give when asked, but it is better to give unasked, through understanding;

And to the open-handed the search for one who shall receive is joy greater than giving. All you have shall some day be given;

Therefore give now, that the season of giving may be yours and not your inheritors'."

Through the years the prophet's words have held true, for even today he who "through understanding" includes the MASSACHUSETTS INSTITUTE OF TECHNOLOGY as a beneficiary in his will can experience thereby a two-fold satisfaction. The successful culmination of his search for a worthy recipient and the anticipated results his generosity will assist in accomplishing. These satisfactions give an added value to the span of man's days and protect his usefulness to his fellowmen far into the future.

The Massachusetts Institute of Technology because of the high quality of the education given its students, its effective research work for aiding America in peace as well as in war, and the high character of its governing body and academic staff qualifies as an institution for serving our American ideals for the present and in the years to come.

But the search, the finding, and the anticipated accomplishments are not enough; for without the properly-worded record, man's plans for the future may go awry. Hence the prophet's importuning, "—give now," should be heeded. The giving need not be an immediate physical transaction, for written directions replace the spoken word when the speaker is no longer present, and a donor can frequently make by will a gift which is larger than he can make while living. Truly, "*it is well to give when asked, but it is better to give unasked, through understanding.*"

A booklet "Gifts by Will," outlining different forms of bequests to M.I.T., is available to you or to your attorney by writing to:

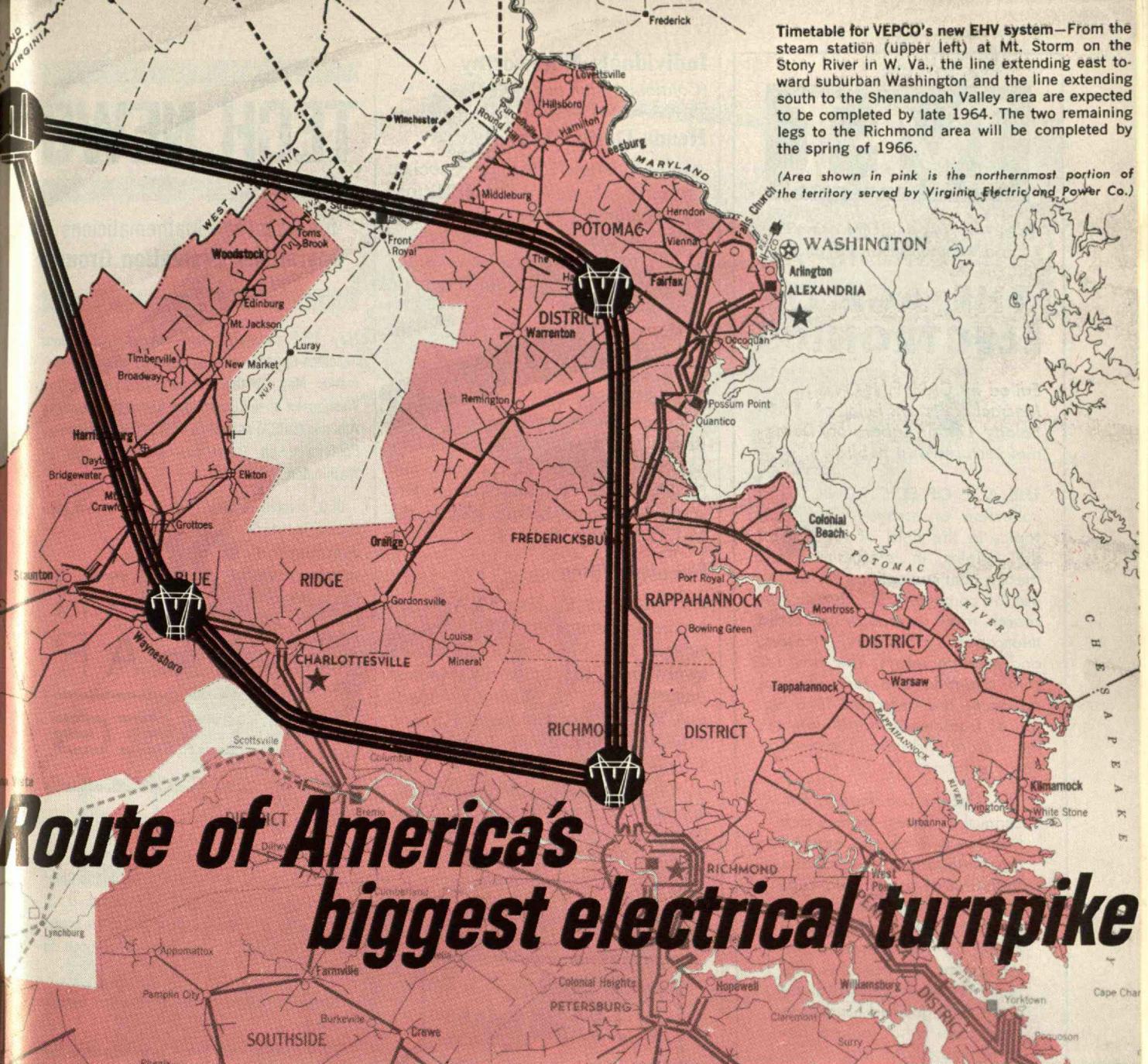
Director of Development

Massachusetts Institute of Technology

Cambridge 39,

Massachusetts

* The "Prophet" by Kahlil Gibran



Timetable for VEPCO's new EHV system—From the steam station (upper left) at Mt. Storm on the Stony River in W. Va., the line extending east toward suburban Washington and the line extending south to the Shenandoah Valley area are expected to be completed by late 1964. The two remaining legs to the Richmond area will be completed by the spring of 1966.

(Area shown in pink is the northernmost portion of the territory served by Virginia Electric and Power Co.)

Route of America's biggest electrical turnpike

C-E selected for more than 1,000,000 kilowatts of steam generating capacity

The Virginia Electric & Power Company will soon begin construction of the country's first commercial transmission system to carry electric energy at a record-breaking 500,000 volts. The 350-mile-long Extra High Voltage line will form an energy turnpike carrying enough electric power to meet the growing needs of VEPCO's customers. A new generating station equipped with two C-E Controlled Circulation Steam Generators will be built in the coal fields of West Virginia to supply power to the EHV circuit.

Why EHV? With Extra High Voltages, greater quantities of energy can be transmitted over much longer distances without excessive power line losses. Gen-

erating stations can therefore be of much larger and more economical sizes and can be located convenient to supplies of low cost fuel. The number of circuits, towers and rights-of-way between user and supplier can be reduced, interconnections with other utility systems made more effective, and the amount of reserve generating capacity required to meet peak loads reduced.

The Generating Plant. VEPCO's EHV system will be powered by a new mine-mouth generating station near Mt. Storm, West Virginia. It will be the seventh C-E equipped VEPCO station and will have two Controlled Circulation Steam Generators to supply steam to two turbo-generators producing 540,000

net KW each. These C-E units will be the nineteenth and twentieth in the VEPCO system and the eleventh and twelfth of Controlled Circulation design.

VEPCO's bold new venture in EHV transmission is a giant step forward in American power practice. It dramatizes the electric utility industry's continuing efforts to assure an abundance of power for a growing America—and illustrates why electric energy continues to be America's biggest bargain.

COMBUSTION ENGINEERING



General Offices: Windsor, Conn.
New York Offices: 200 Madison Ave., N. Y. 16

MH

describes most recent scientific and technological advances

THE AGE OF ELECTRONICS

Edited by CARL F. J. OVERHAGE, Massachusetts Institute of Technology. Lincoln Laboratory Decennial Lectures. Just published.

THE AGE OF ELECTRONICS is a collection of essays on selected topics in the field of electronics: the origins in electro-magnetic theory, communications, radar, the use of computers in scientific research, radio astronomy and radio telescopes, transistors, masers, and satellite relays. The most recent scientific and technological advances are described in a historical framework that illuminates the present and permits projection into the future.

The Lincoln Laboratory, Decennial Lectures, from which this book evolved, marked the tenth anniversary of the founding of the Lincoln Laboratory of the Massachusetts Institute of Technology as a center of research and development in electronics. The lectures were delivered by eight distinguished leaders in electronics who looked beyond immediate preoccupations at the larger context in which scientists and engineers live and work.

Contributors include: Lloyd V. Berkner • Edward G. Bowen • Hendrik B. G. Casimir • Ivan A. Getting • John R. Pierce • William Shockley • Charles H. Townes • Stanislaw M. Ulam

TABLE OF CONTENTS

Preface	and Scientific Research
Introduction	Radio Astronomy and Radio Telescopes
Maxwell, Hertz, and Lorentz	Transistors
Communications	Masers
Radar	Satellite Relays
Electronic Computers	Index

reserve your on-approval copy

McGRAW-HILL
BOOK COMPANY, INC.
330 West 42nd Street
New York 36, N. Y.

Individuals Noteworthy

(Continued from page 4)

Heads Design School

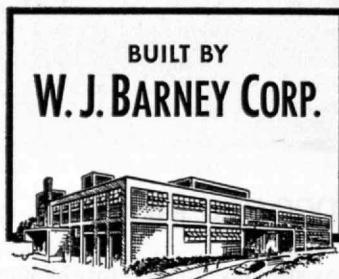
ALBERT BUSH-BROWN, Associate Professor of Architectural History and Executive Officer of the Department of Architecture, is leaving M.I.T. to become president of the Rhode Island School of Design on June 30.

He is the author of a book about Louis H. Sullivan, '74, and collaborated with Dean John E. Burchard, '23, in writing *The Architecture of America*. He received his degrees at Princeton, was a member of the Society of Fellows at Harvard, and taught at Princeton and Western Reserve University before joining the M.I.T. Faculty in 1954.

Faculty Notes

DR. HARRIET L. HARDY, Assistant Medical Director at M.I.T., has received the William S. Knudsen award from the Industrial Medical Association . . . Elting E. Morrison, Professor of Industrial History, gave three Trumbull Lectures at Yale this spring . . . Paul A. Samuelson, Professor of Economics, opened a series of lectures on "New Horizons in Economic Progress" at Wayne State University in March.

(Continued on page 40)



McKesson & Robbins, Inc.
Chapman, Evans & Delehanty, Architects

Good thing to remember!

WHEN you contract for a new building, you are buying materials and service. The materials are more or less standardized—but not the service. That's a human factor which comprises experience, integrity, organization, and alertness to your needs . . . Over 70% of our work is for those we have previously served.

W. J. BARNEY CORPORATION
Founded 1917
INDUSTRIAL CONSTRUCTION
101 Park Avenue, New York
Alfred T. Glassett, '20, President

TECH NEWS

for Scientists, Mathematicians
Operations Evaluation Group

May 1962 certainly stood out as "Operations Research Month"—in fact, if not by official proclamation. May saw the 10th anniversary meeting in Washington of the Operations Research Society of America (ORSA) as well as OEG's 20th Anniversary Conference on Operations Research, also in Washington.

OEG, created in May 1942, is the oldest continuing military operations research organization in the country. The 20th Anniversary Conference—of international scope—reviewed applications of OR in NATO, in industry and public health, and in fiscal planning for defense, as well as considering OR education.

OEG acts as civilian scientific advisor to the Chief of Naval Operations and the Commandant, U. S. Marine Corps, functioning in diverse problem areas. Typical problems OEG has been called upon to solve include:

- What Navy vehicles would profit most from nuclear propulsion?
- Can a workable radar theory be formulated at the present state of the art?
- Set up exercise conditions to test the effectiveness of fleet air defense.
- What are the requirements for fire support of future amphibious operations?

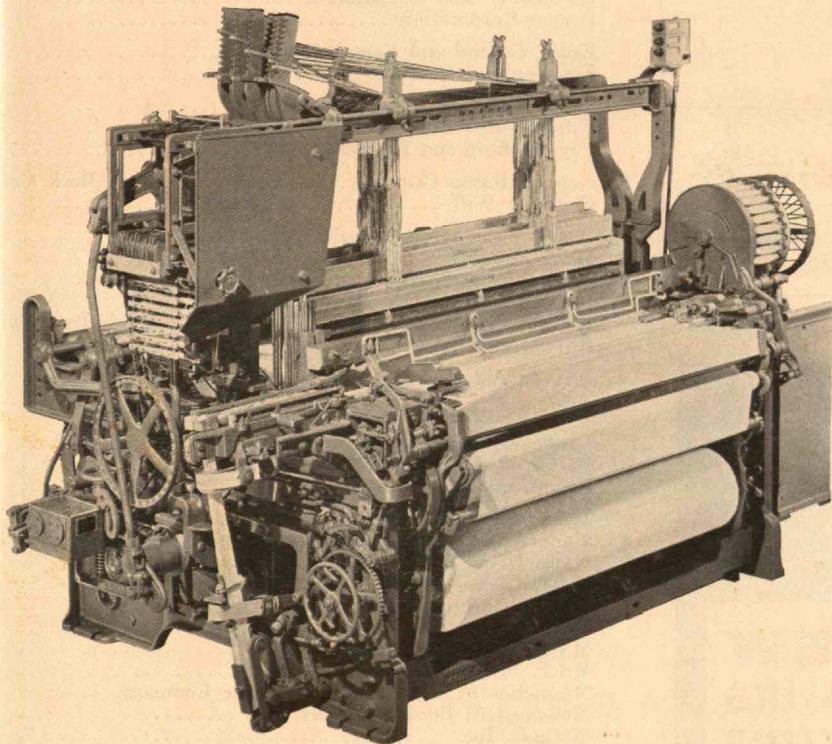
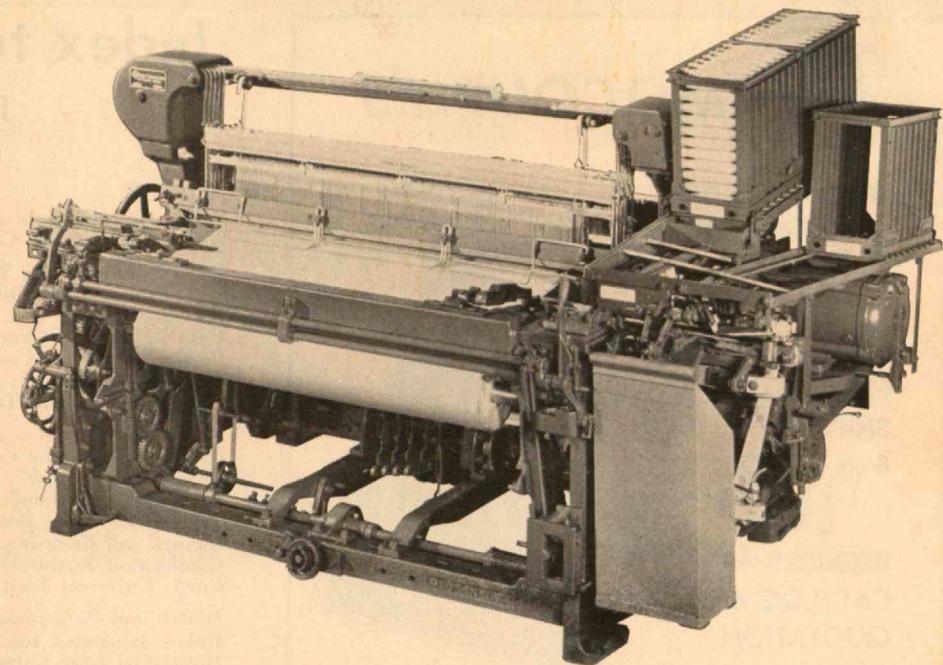
This is complex and essential work. It requires scientists, preferably with advanced degrees, who can combine analytical talent with a certain amount of enterprise. If you are a mathematician, physicist, engineer or economist, and the potential inherent in OEG's program sounds rewarding, please send your resume to the Director, Dr. Jacinto Steinhardt.

OEG

OPERATIONS EVALUATION GROUP

Arlington Towers, Arlington 9, Virginia

An equal opportunity employer



DRAPER CORPORATION

Engineers and manufacturers for the world's most accepted high-speed, automatic looms.

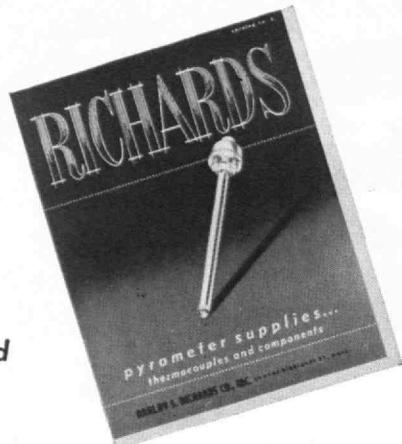
THERMOCOUPLES

PROTECTION TUBES
THERMOCOUPLE WIRES

LEAD WIRE
INSULATORS

PROMPT
SHIPMENT
from STOCK

REQUEST
CATALOG and
QUOTATION



Arklay S. Richards '19

Arklay S. Richards Co., Inc.

Manufacturers since 1938

4 Winchester Street
NEWTON HIGHLANDS 61, MASS.

**NEW
VIBRATING
CAPACITOR**

A vibrating-reed type capacitance modulator for use in measuring currents as low as 10^{-16} amperes. Long term stability for process control. Drift ± 0.2 millivolts per day, non-cum.

Write for Catalog 523.

**STEVENS
INCORPORATED
ARNOLD**

7 ELKINS STREET
SOUTH BOSTON 27, MASS.

12-1/4

Index to Advertisers

June, 1962

Advertiser

Advertiser	Page
Aerofin Corporation	53
Albert Pipe Supply Company, Inc.	48
Barney Corporation, W. J.	10
Barnstead Still and Sterilizer Company	51
Bergeson, Lloyd	54
Boit, Dalton and Church	51
Boston Publishing Company, Inc.	52
Brewer and Lord	52
Brewer Engineering Laboratories	55
Cabot Corporation	1
Capitol Engineering Corporation	55
Charles River Park	42
Chauncy Hall School	54
Cleverdon, Varney and Pike	55
Coburn and Company, William H.	54
Combustion Engineering, Inc.	9
Curtis Universal Joint Company, Inc.	48
DeBell and Richardson, Inc.	53
Debes Associates, Inc., Charles Nelson	55
Diefendorf Gear Corporation	53
Draper Corporation	11
Eadie, Freund and Campbell	55
Emerson and Cuming, Inc.	2
Fabric Research Laboratories, Inc.	55
Fairfield and Ellis	43
Fay, Spofford and Thorndike, Inc.	55
General Radio Company	Back Cover
Gifts By Will	8
Harvard Cooperative Society	49
Hawkins and Sons, Company, H. H.	42
High Voltage Engineering Corporation	5
Hitcheck Associates, Lauren B.	55
Hoechst-Uhde Corporation	Inside Back Cover
Holmes and Narver Inc.	50
Jackson and Moreland, Inc.	55
Kuljian Corporation, The	55
Lawrence Radiation Laboratory	18
Lockheed Missiles and Space Company	16
Loomis and Loomis	55
Main, Inc., Chas. T.	54
Manufacturers Mutual Fire Insurance Company	41
Massa Division, Cohu Electronics, Inc.	17
M.I.T. Choral Society	44
M.I.T. Instrumentation Laboratory	40
M.I.T. Lincoln Laboratory	6
M.I.T. Office of Publications	46
M.I.T. Press, The	51
Massachusetts Mutual Life Insurance Company	56
McGraw-Hill Book Company, Inc.	10
McQuay, Inc.	7
Melpar, Inc.	46
Metcalf and Eddy	55
Mitre Corporation, The	45
Moran, Proctor, Mueser and Rutledge	55
National Aeronautics and Space Administration	39
O'Connor and Company, Inc., Thomas	13
Operations Evaluation Group, M.I.T.	10
Reidy, Maurice A.	55
Rhodes and Associates, Philip H.	54
Richards Company, Inc., Arklay S.	12
Soil Testing Services, Inc.	48
Spalding Inn	42
Sprague Electric Company	Inside Front Cover
Stevens-Arnold, Inc.	12
Syska and Hennessy, Inc.	54
Taylor and Sons, Thomas	47
Tredennick-Billings Company, The	52
Webb Corporation, Del E.	14
Willsea Works	54
Wyant Conditioning Corporation	51
Wyle Laboratories	15

DANIEL G. O'CONNOR, President

AUSTIN J. O'CONNOR, Executive Vice-President

THOMAS O'CONNOR & CO., INC.

STRUCTURAL ENGINEERS

AND BUILDERS

KENDALL SQUARE, CAMBRIDGE, MASS.

UNiversity 8-7330

AUSTIN J. O'CONNOR—'19

THOMAS H. O'CONNOR—'30

EUGENE T. SULLIVAN—'33

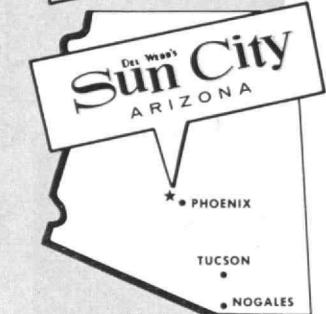
THOMAS F. GALVIN—'33

WILLIAM A. SHEA—'36

THOMAS H. O'CONNOR, Vice Pres. and Clerk

THOMAS D. O'CONNOR, Treasurer

in 3
Sun-Filled
Fun-Filled
States



DEL WEBB'S

active

RETIREMENT

is waiting for you in four
HAPPY, FRIENDLY, LIVELY TOWNS

Specifically Designed for This Unique and Proven Way-of-Life . . . In each of these beautiful and complete communities, Del Webb offers everything which his extensive experience revealed you wanted most: A location with a health-filled, sun-splashed climate and close proximity to good hunting and fishing and all kinds of interesting things to see and do . . . top-quality, modestly-priced homes . . . plus a wide variety of established facilities for recreation and creative activity *right at home*.

CHAMPIONSHIP GOLF COURSE RIVIERA-SIZE SWIMMING POOL
SHUFFLEBOARD LAWN BOWLING PUTTING GREEN
FULLY-EQUIPPED ARTS & CRAFTS CENTER
COMPLETE TOWN HALL AGRICULTURAL PROJECT
MODERN SHOPPING CENTER

Reserved Exclusively for Those "Over-Fifty"

The success of this unique concept has been proven by 5,000 residents of Sun City, Arizona, where Del Webb first introduced it in 1960. With this new Way-of-Life, reserved for those past fifty (partners may be of any adult age) you have freedom to do *what you want, when you want . . .* and enjoy all of your hobbies and clubs. Everything from stamp collecting to sports, railroading, arts and crafts, patriotic, civic and business organizations . . . they are all represented in a Del Webb town.

DEL E. WEBB CORPORATION

Send for the
FREE Full-Color Story of Del Webb's
City in Your Favorite Location
(Check choice and send to the appropriate address)
 KERN CITY, P. O. Box 188-AA-1, Kern City, CALIF.
 SUN CITY, P. O. Box 878-AA-1, Perris, CALIF.
 (Open June 1962)
 SUN CITY, P. O. Box 555-AA-1, Sun City, ARIZONA
 SUN CITY, Box 5000-AA-1, Sun City Center, FLA.
 Please send information on low-cost round-trip
bus fares via TRAILWAYS

Name _____
Address _____
City _____ State _____
NOTE: If information on more than one
location is desired, please send separate
rate coupon or postcard
for each.

AD 61100 (Q-5)

7,500 Force-Pound Random Vibration Capability



Most Powerful Available on East Coast

Wyle Laboratories' Parameters Division, Westbury, New York, has available new, advanced vibration systems which meet the test requirements of the latest and most powerful missiles, such as Titan II.

Equipment includes a Ling Model 275 exciter, a Ling Model A246 exciter, a Ling Model PP50/70 Amplifier, and a Ling ESD20/ASD20 spectral density equalizer/analyizer which permits continuous and parallel observation and control of spectrums in random vibration test programs. Through the use of the very large PP50/70 amplifier, full random vibration ratings are realized from either shaker, with force ratings as follows:

A246
Random 7,000 force pound RMS
Random 21,000 force pound peak
(Sine 7,500 force pound vector)

275
Random 7,500 force pound RMS
Random 22,500 force pound peak
(Sine 10,000 force pound vector)

Largest independent testing company in the United States, Wyle Laboratories specializes in the testing of missile, aerospace, aircraft, and electronic components and systems at facilities in El Segundo and Norco, California, Huntsville, Alabama, and Westbury, New York.

Frank S. Wyle '41

**When You Need
Testing...
Remember WYLE!**

- Vibration...Sine and Random
- High-Flow/High Pressure Hydraulic Flow Systems
- Controlled-Environment Laboratories for Testing Electrical, Electronic, and Instrumentation Components
- Clean Rooms for LOX-Cleaning, Millipore Analyses, Packaging, etc.
- Simulation of Virtually All Natural and Induced Environments Including...

NATURAL	INDUCED
ALTITUDE	SHOCK
TEMPERATURE	VIBRATION
SALT SPRAY	ACCELERATION
SAND & DUST	
HUMIDITY	
FUNGUS	

- 12' x 8' x 8' Walk-In Altitude-Temperature Chamber

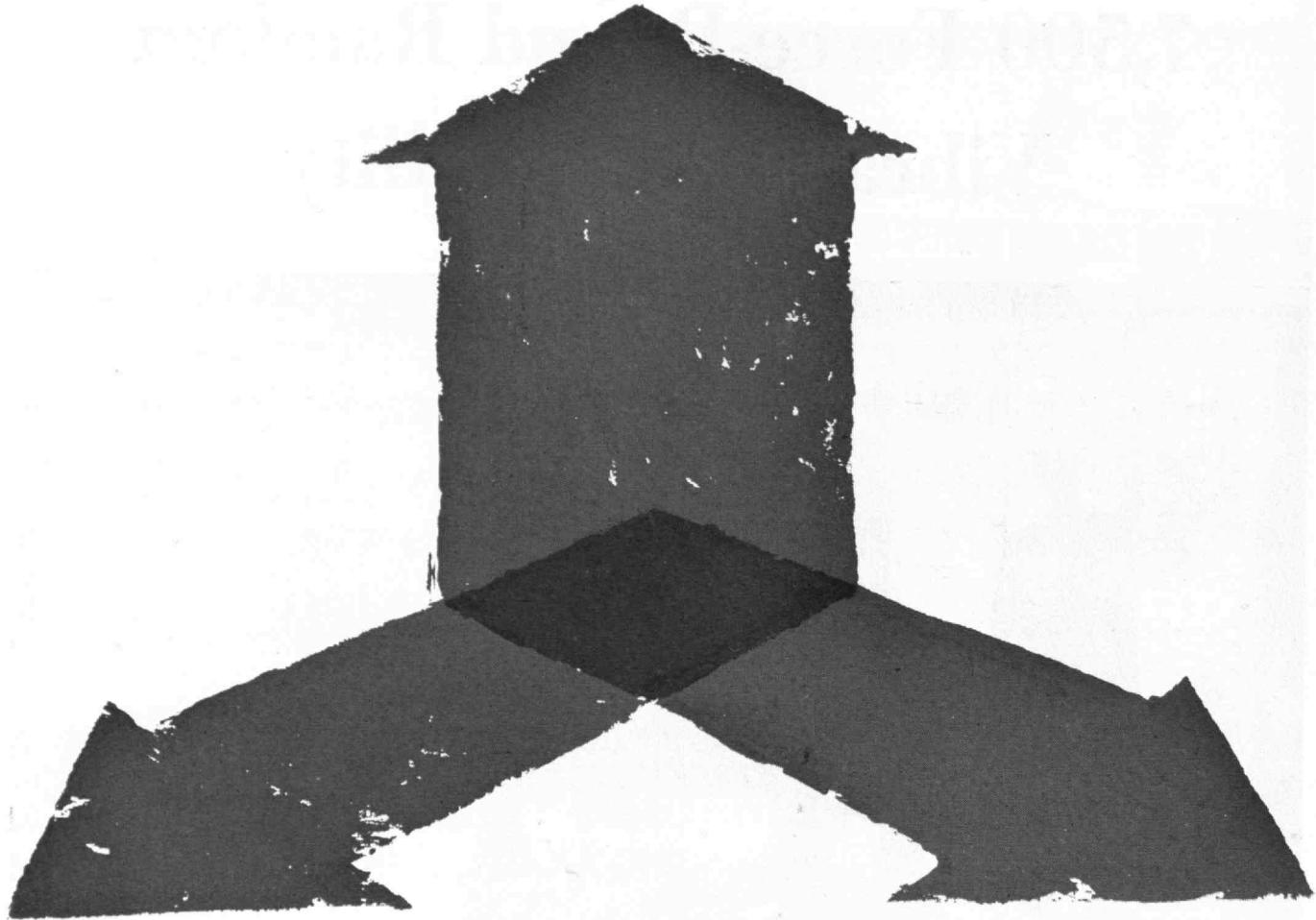
FOR FURTHER INFORMATION
OR ENGINEERING ASSISTANCE
ON YOUR ENVIRONMENTAL
TESTING PROBLEMS.

PLEASE CONTACT HARRY SCHACHTER,
DIVISION GENERAL MANAGER AT WESTBURY.



WYLE LABORATORIES

110 Hopper Street, Westbury, Long Island, New York • EDgewood 3-7650 • TWX WSBY NY 2555



Said Hans Oersted: "When a conductor carries current through a magnetic field at right angles to it, the resultant reaction thrusts the conductor in a direction perpendicular to both the current and the magnetic field."

A light-weight, low fuel-consuming propulsion system is a primary requirement for interplanetary space vehicle travel. One such system now being carefully studied utilizes plasma propulsion.

This concept employs an electrical field to produce a plasma and to energize it. A magnetic field then ejects the plasma, thereby providing a reactive thrust to the vehicle.

Plasma propulsion is but one of many subjects under investigation at Lockheed Missiles & Space Company. Outstanding facilities, equipment and scientific personnel mark the organization as eminently capable of exploring many unusual aspects of space travel. This, coupled with Lockheed's favorable locations in Sunnyvale and Palo Alto on the beautiful San Francisco Peninsula, consistently attracts scientists and engineers interested in pursuing work in their special fields.

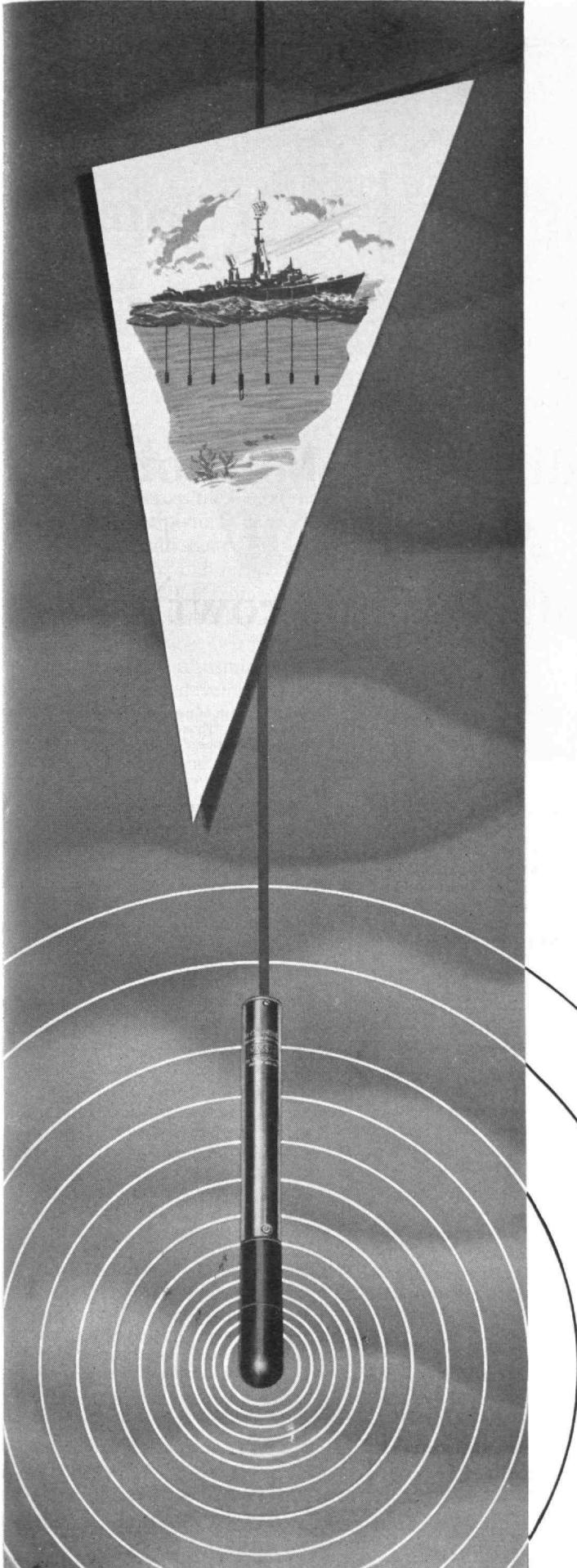
Why not investigate future possibilities at Lockheed? Write Research and Development Staff, Dept. M-26C, 599 Mathilda Avenue, Sunnyvale, California. An Equal Opportunity Employer.

LOCKHEED MISSILES & SPACE COMPANY

A GROUP DIVISION OF LOCKHEED AIRCRAFT CORPORATION

Systems Manager for the Navy POLARIS FBM and the AGENA vehicle in various Air Force Satellite programs. Other current projects include such NASA programs as the OGO, ECHO, and NIMBUS.

SUNNYVALE, PALO ALTO, VAN NUYS, SANTA CRUZ, SANTA MARIA, CALIFORNIA • CAPE CANAVERAL, FLORIDA • HAWAII



MASSA . . .

30 YEARS' EXPERIENCE CONTRIBUTES TO

ASW DETECTION CAPABILITIES

The Massa Division of Cohu Electronics, Inc., is a pioneer in electroacoustics. Its contribution to the basic science of acoustics has established many fundamental concepts upon which this important industry has advanced. Among the many original contributions made by Massa is the design of the first ADP (Ammonium Dihydrogen Phosphate) crystal sonar transducer.

Massa has produced tens of thousands of transducers ranging from low cost depth sounding units to elaborate beam scanning types used in many U. S. Navy sonar systems. The Massa Model M-115B (shown on left) has been in wide use as an underwater reference measurement standard for 15 years without measurable change in its original calibration.

Long experience in the use of all types of transducer materials . . . PIEZOELECTRIC CRYSTALS, POLARIZED CERAMICS, MAGNETOSTRICTION, ELECTROMAGNETIC and ELECTRODYNAMIC Systems . . . permits impartial analysis to select the best material for each application. .

Write for Capabilities Brochure.

A few openings are available for qualified electroacoustic engineers.
Send outline of experience to the attention of Mr. Frank Massa.

An equal opportunity employer.

FRANK MASSA
PRESIDENT
BSEE '27, MS '28

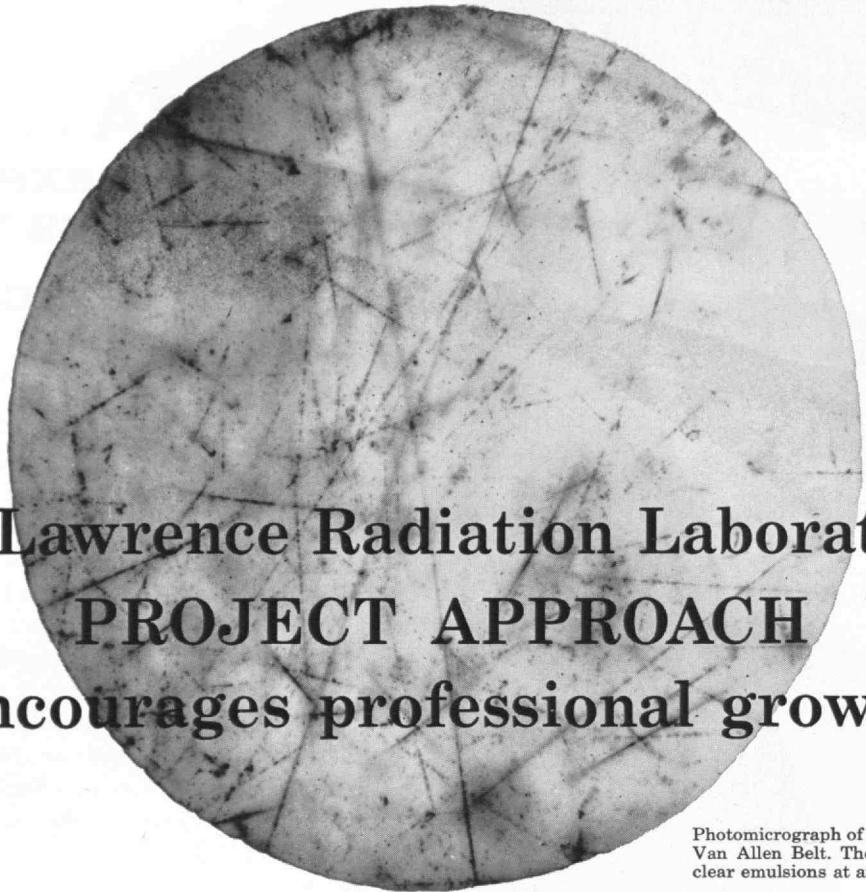
A. C. DENAPOLI
VICE PRES.
BSEE '27

ERNEST A. MASSA
EXEC. VICE PRES.
BS PHYSICS '34

JOHN J. FLYNN
GOVT. CONT. MGR.
BSME '49

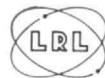
MASSA
A DIVISION OF
COHU
ELECTRONICS, INC.

280 LINCOLN STREET
HINGHAM, MASSACHUSETTS



The Lawrence Radiation Laboratory's PROJECT APPROACH encourages professional growth

Photomicrograph of protons trapped in the lower Van Allen Belt. These protons entered the nuclear emulsions at an altitude of about 800 miles.



At LRL the skills of virtually every scientific and technical discipline are used in conducting fundamental explorations of the atomic nucleus and developmental programs growing out of nuclear research. The "project" approach to the various programs enables the specialist to perform with maximum effectiveness and to familiarize himself with the activities in several fields other than his own. The broad range of activities at the Laboratory can be divided roughly into three categories:

PHYSICS AND CHEMISTRY

The many fields of physics investigation include fission reactions, neutronics, hydrodynamics, high- and low-energy physics, numerical analysis, geophysics and astrophysics. The broad scope of the problems encountered requires the imaginative efforts of both theoretical and experimental physicists with many different interests.

In Chemistry, long-range experimental and theoretical studies, applied

research programs, materials development work, and, on occasion, limited production of novel materials needed by the Laboratory exemplify the variety of work performed by chemists and engineers of many specialties.

ENGINEERING AND DEVELOPMENT

The successful collaboration of engineers and scientists has made LRL a leader in the development of unique research apparatus and diagnostic equipment. Mechanical Engineering responsibilities include design and fabrication of nuclear and high explosive devices, analytical and experimental studies, mechanical design, non-destructive and environmental testing, metrology, and production coordination.

Electronics designs and develops systems for automatic and servo control, reactor control, instrumentation and simulation, data acquisition, data reduction and energy storage and transfer, and provides electronics consulting service throughout the Laboratory.

COMPUTATION

The LRL computer complex, one of the

largest in the nation, includes 3 7090's, a 650, a 1401, LARC, STRETCH, and attendant input-output equipment. The majority of problems are concerned with multidimensional, coupled, partial differential equations of hydrodynamics, heat transfer, and neutron diffusion.

CURRENT PROJECTS

The Laboratory's manifold activities are conducted at three locations — Berkeley and Livermore in the San Francisco Bay area, and the Nevada Test Site near Las Vegas, Nevada.

The Laboratory at Livermore is presently active in four long-range research projects: Whitney, the design and testing of nuclear and thermonuclear explosives; Plowshare, the development of scientific and industrial uses for nuclear explosives; Sherwood, research into control of the fusion reaction, and Pluto, the development of a very high temperature reactor for powering a ramjet propulsion system.

LRL particularly needs scientists and engineers who have the skill and imagination to solve an ever-changing array of new and novel problems.

nuclear energy research

For further information on facilities and work at LRL, write to:
B. R. Graf, Associate Personnel Mgr., Box 808, Livermore, Calif.

LAWRENCE RADIATION LABORATORY
An equal opportunity employer. U.S. citizenship required.

Operated by the
University of California for the U.S. Atomic Energy Commission

Trend Of Affairs



Satellite TV's Debut

LINCOLN LABORATORY men transmitted the first television picture across the United States by way of a satellite in April. The picture (at right) was sent from a field station in the hills near San Francisco (shown at the top of the page) and received on Millstone Hill near Boston. The satellite from which the picture was reflected was the wrinkled, partially deflated Echo I balloon launched nearly two years ago.

The microwave transmitting and receiving equipment that was used was developed for Project West Ford, an experiment in passive satellite radio communication via a belt of tiny metallic dipole fibers in orbit. The work was sponsored by the U.S. Air Force, and the participants included D. H. Hamilton, Jr., H. H. Hoover, Jr., R. V. Locke, Jr., '61, D. C. MacLellan, '57, W. E. Morrow, Jr., '49, B. E. Nichols, T. F. Rogers, and P. Waldron.

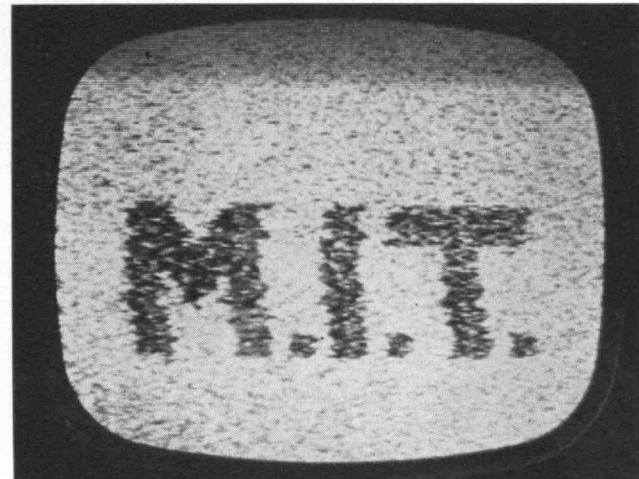
The signals received were weak and the picture was snowy because of the aging balloon's condition. This and the difficulty of tracking it with beams only one-tenth of a degree wide caused it to fade in and out. Echo I is so large and light that its orbit is not steady and cannot be predicted with sufficient accuracy more than a few hours in advance. It was tracked by optical telescopes with great care on one 12-minute passage overhead, and used for the picture transmission on the next passage.

The balloon was at an altitude of about 1,000 miles, the ground stations were about 2,800 miles apart, and the transmissions were made at a frequency of 8,350 megacycles with a transmitter power of 20,000 watts.

Duels Amidst the Stars

THE Programmed Data Processor (PDP-1) in the Compton Building at M.I.T. is being used occasionally now to simulate duels in space. This is the same computer that was programmed several months ago to play mancala, an ancient counting game, in ways similar to those that men play.*

For space duels, a program has been devised in which tiny images of two space ships appear on the face of the computer's oscilloscope. Each of two players is given a set of switches with which he may accelerate one of these images, turn it to the left or right, and



fire make-believe torpedoes from it toward his opponent's ship.

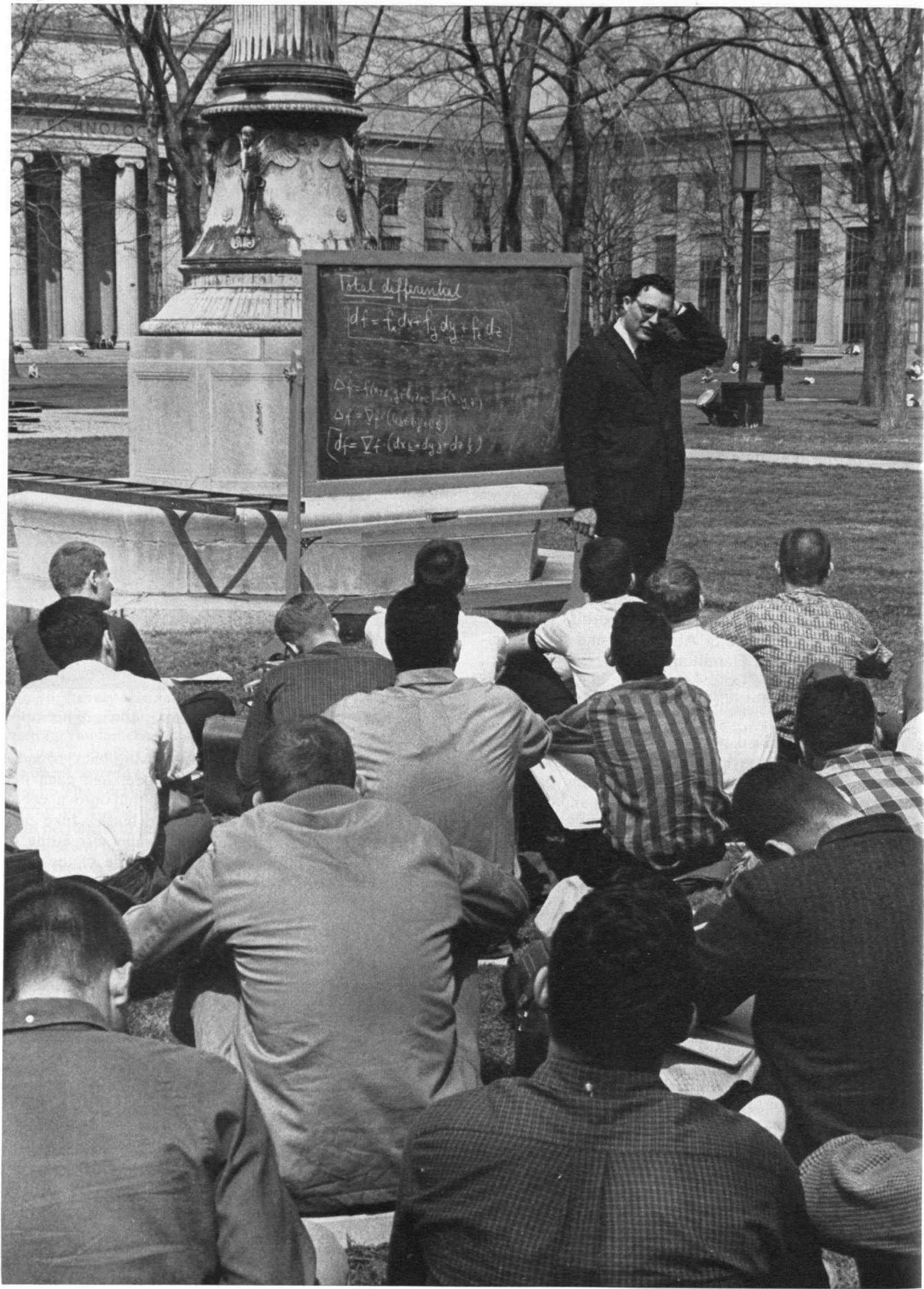
The ships maneuver against a moving background of stars, correct to the fourth magnitude, and each pilot must be careful not to let his ship fall into a central star. But the surface on which the battles take place is that of a torus, so there is no danger of getting out of bounds. If a ship vanishes at one side of the scope, it instantly reappears on the other side.

Quick-fingered fellows, with a little practice, can battle for a couple of minutes without a casualty. Longer duels are likely, however, when the game is further improved. The machine's programmers are working now on a plan to add a "hyperspace" provision, which will permit a ship in danger of extinction simply to disappear from wherever it happens to be and reappear suddenly somewhere else.

Stephen B. Russell, '60, wrote the original program for simulating space duels on the computer's scope. Daniel J. Edwards, '59, put in a central star with a strong gravitational pull. Peter Samson added the stars of the equatorial constellations which move majestically across the scope during the duels, and J. Martin Graetz is working on the plan to introduce hyperspace.

Some students would like to be able to say, "Let's step outside and settle that matter with space weapons," whenever they wish, but that isn't possible yet because the PDP-1 is busy doing other things most of the time. Fellows eager to man the ships for a space duel sometimes have to wait until 2:00 or 3:00 A.M.

*See Technology Review, April, 1962, page 26.



Among this year's first squatters in the Great Court were Dr. Gian-Carlo Rota's mathematics students, early in April.

Bone Sterilization Service

THE M.I.T. High Voltage Research Laboratory has become a major center for sterilization of bones used in bone-graft operations, and is currently serving medical groups not only locally but as far away as Florida and California. Every week scores of pieces of bone-graft material are rendered surgically sterile by exposure to a beam of electrons from its Van de Graaff accelerator—built in the 1940's for studies of the properties of high-energy particles and their effects on living and nonliving structures.

Electron radiation kills germs in or on bone material without significantly damaging it. Bone-graft material generally is obtained from recently deceased persons with the approval of their next of kin. Medical centers freeze each piece, seal it in plastic, and ship the material to the Institute in insulated packing boxes.

It goes through the electron beam on a remotely controlled carrier belt in a shielded basement room while an operator observes the process by closed-circuit television. Medical centers usually get it back within from 36 to 48 hours and store it in hospital bone banks for use when needed. Sealed and frozen pieces can be kept for many months.

A principal use for such bone is in spinal fusion operations where vertebrae are joined permanently. It also has made surgical procedures possible for children who could not be treated satisfactorily otherwise. Drs. Jonathan Cohen of the Children's Hospital in Boston and C. Andrew L. Bassett of the New York Orthopedic Hospital were among the participants in working out the techniques. Professor John G. Trump, '33, and his associate, Kenneth A. Wright, '47, consider this work a logical outgrowth of their laboratory's research.

Diets, Mice and X-rays

EVIDENCE that a dry synthetic diet may increase the ability of mice to survive exposure to x-rays was presented at the April meeting of the American Societies for Experimental Biology. The researchers, Henry A. Dymsza, Sanford A. Miller, and John F. Maloney, Jr., of the M.I.T. Department of Nutrition, Food Science and Technology noted that there are fundamental differences in the physiology, metabolism, and response to radiation of mice and men, and warned against too rapid extrapolation of their evidence to humans; but further such studies, they suggested, might be a guide to the selection of food for storage in fallout shelters.

Their work was done with 600 mice divided into 10 groups and fed 10 different diets. Thirty-four per cent of those fed dry synthetic diets survived near lethal doses of x-rays for up to 30 days after exposure, compared to only 16 per cent of those fed natural diets or synthetic diets suspended in watery gel.

The natural diets included a complex commercial preparation containing 11 different food ingredients, a simple diet containing ground whole wheat and dried whole milk and salt, the same simple diet with vitamins added, the simple diet with minerals added, and the simple diet with both vitamins and minerals added. The synthetic diets were made up of dry food fractions—milk protein in the form of casein, sugars in the form of dextrose and dextrin and sucrose, vitamins and minerals. One contained high fat in the form of lard and corn oil, another contained low fat, and a third had



Kenneth A. Wright, '47, placing bone-graft material on a bed of dry ice for sterilization in the high-voltage laboratory.

yeast added. The other two synthetic diets—one high fat, the other low fat—were mixed with agar into the form of a gel containing 50 per cent water by volume.

After the mice had been fed these diets for a week, 50 animals from each group (leaving 10 per group for controls) were exposed to 750 roentgens of whole body x-radiation at the rate of 45 roentgens per minute. Mice generally are able to withstand higher radiation doses than humans, but usually die—if they are going to—within 30 days after x-ray exposures at this level.

Following exposure, the mice were returned to their respective diets and observed for 30 days. Both before and after exposure, the mice were given water to drink at will, but only in the case of the two gel synthetic diets was the foodstuff itself combined with water. Survival rates by diet were: Complex natural, 12 per cent; simple natural, 17 per cent; simple natural plus vitamins, 23 per cent; simple natural plus minerals, 13 per cent; simple natural plus vitamins and minerals, 18 per cent; synthetic low fat, 37 per cent; synthetic high fat, 31 per cent; synthetic plus yeast, 35 per cent; synthetic low fat in gel form, 12 per cent; synthetic high fat in gel form, 8 per cent.

"It may be concluded, therefore, that under conditions of the experiment, the composition of the diet may significantly alter the response of mice to x-irradiation," the M.I.T. group said. "The reasons for the difference in survival with various diets are not known . . . (but) the study suggests that it may be possible to design diets which will increase the resistance of organisms exposed to sublethal radiations."

Exploring the Rat's Brain

RECENT STUDIES in the M.I.T. Psychophysiological Laboratory suggest that the mammalian brain's regenerative capabilities have been underestimated heretofore. Its nerve cells are developed when the organism is in an embryonic stage. These cells have not been seen dividing, the way most other cells do, to form new ones later on. Hence, it has been widely assumed that once a nerve cell was destroyed it could not be replaced. The work now under way, however, has raised doubt about this.

"Are New Neurons Formed in the Brains of Adult Mammals?" was the title of a report in *Science* last March 30 on this work that Joseph Altman and Mrs. Altman are doing. In this research they have used thymidine tagged with the radioactive isotope of hydrogen, tritium. This isotope has enabled them to obtain some remarkable, fine-grain pictures which indicate that nerve cells may be formed within the injured brain of an adult rat.

The rat's brain contains about 10 times as many glial cells as nerve cells. These glial cells can proliferate around small wounds, and this is the biological process that the Altmans set out to study. The cells need chromosomal DNA to proliferate and must have thymidine to produce it.

After injuring a rat's brain in the region through which nerve fibers carry information from the eyes to the visual centers, the Altmans have injected tiny amounts of radioactive thymidine and traced the use made of it. Much of it, they have found, quickly appears in the nuclei of glial cells that appear around the wound and along nervous pathways which connect the

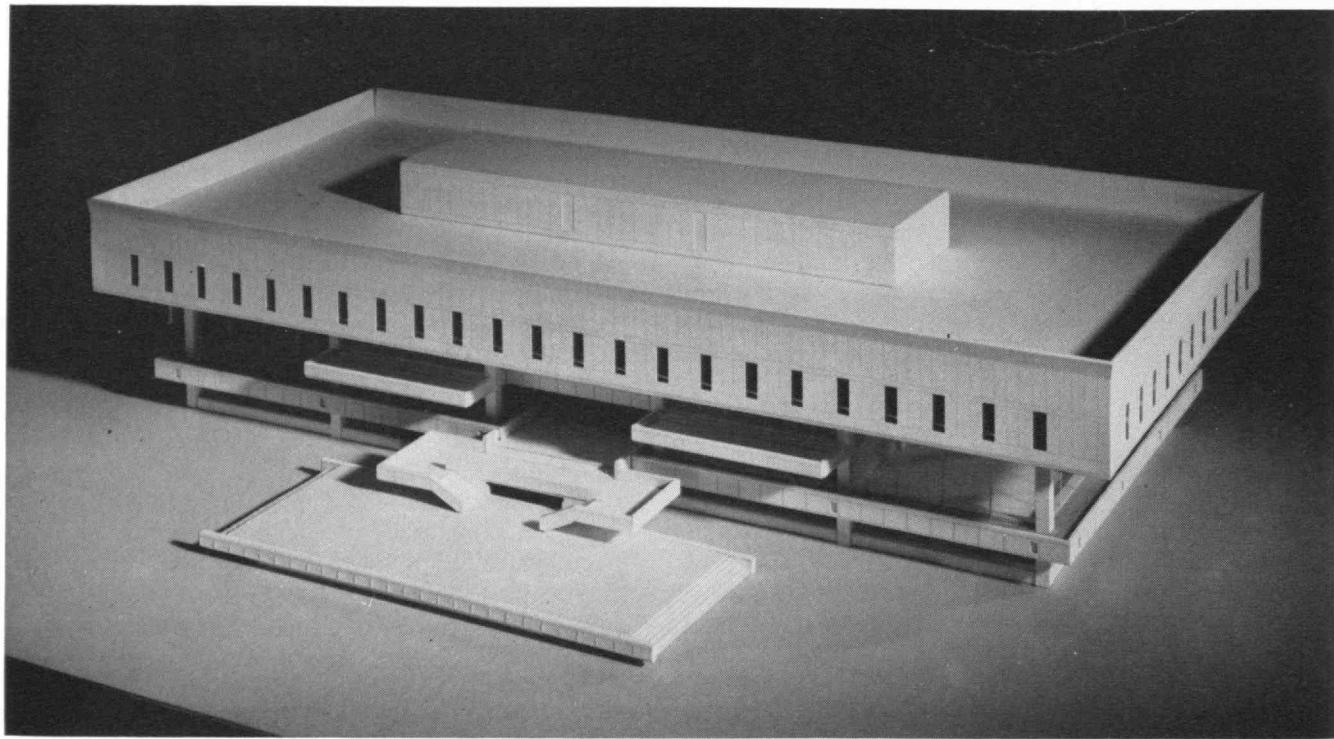
injured part of the brain with other brain structures. The radioactive molecules can be seen as tiny black spots in the nuclei of such cells when sections of the brain are coated with photographic emulsion, exposed for a certain period, and then developed.

The surprising discovery that the Altmans reported in *Science* is that some such black dots also have been found in a few nerve cells. This indicates that not only the glial cells but also the nerve cells have made use of the thymidine, and suggests that they, too, may be capable of producing DNA and dividing to form new cells.

How useful such nerve cells might be to a rat, the Altmans cannot say. Nor can they specify the conditions required for the creation of new nerve cells. Their radioautographic technique, however, may be capable of revealing more information about what goes on in the tiny head of a rat. They now are systematically administering larger doses of thymidine and other radiochemicals to normal as well as to injured rats' brains.

Technical Report Center

THE M.I.T. Library is one of 12 recently selected as a Regional Technical Report Center to make unclassified results of federally supported research and development more widely available. The Department of Defense, National Aeronautics and Space Administration, and the Atomic Energy Commission will provide copies of their reports to each of these 12 centers, as part of a program developed by the National Science Foundation and the Department of Commerce. The M.I.T. Library will serve five New England states.



A STUDENT UNION BUILDING proposal prepared by Professor E. F. Catalano of the Department of Architecture is now being studied at M.I.T. It calls for a four-story structure such as this, with commercial establishments on the first floor, social and dining rooms on the second, and

headquarters for student organizations on the upper floors. The site is near the Du Pont Center where a commercial building was destroyed by fire last year. In addition to plans for such a structure, the Institute is considering a proposal to connect it to the main buildings by a tunnel.

Hams to Use Satellite

RADIO HAMS led by Raphael Soifer, '63, are preparing to bounce signals off the Echo A-12 communications satellite that the United States expects to launch this summer or fall. It will be an orbiting 135-foot reflecting sphere if all goes well, and the National Aeronautics and Space Administration will provide the hams with advice, technical data, and tracking information.

The Office for Satellite Co-ordination (OSSC), which Mr. Soifer heads, grew out of experiments that he and others conducted in 1960 and now has 83 members throughout the world. It is planning this year's work with the help of the American Radio Relay League which was founded in 1914 by Hiram P. Maxim, '86. Some of its members have bounced radio signals off the ionized trails of Explorer VII and Sputnik III.

Mr. Soifer says the hams hope "to get a good response so that we can integrate Echo A-12 into our day-to-day operation and extend our reliable communication range." The range of tropospheric scatter communication now used by hams operating in the VHF region is about 500 miles, and possibly can be doubled by use of the satellite.

Grants for Graduate Work

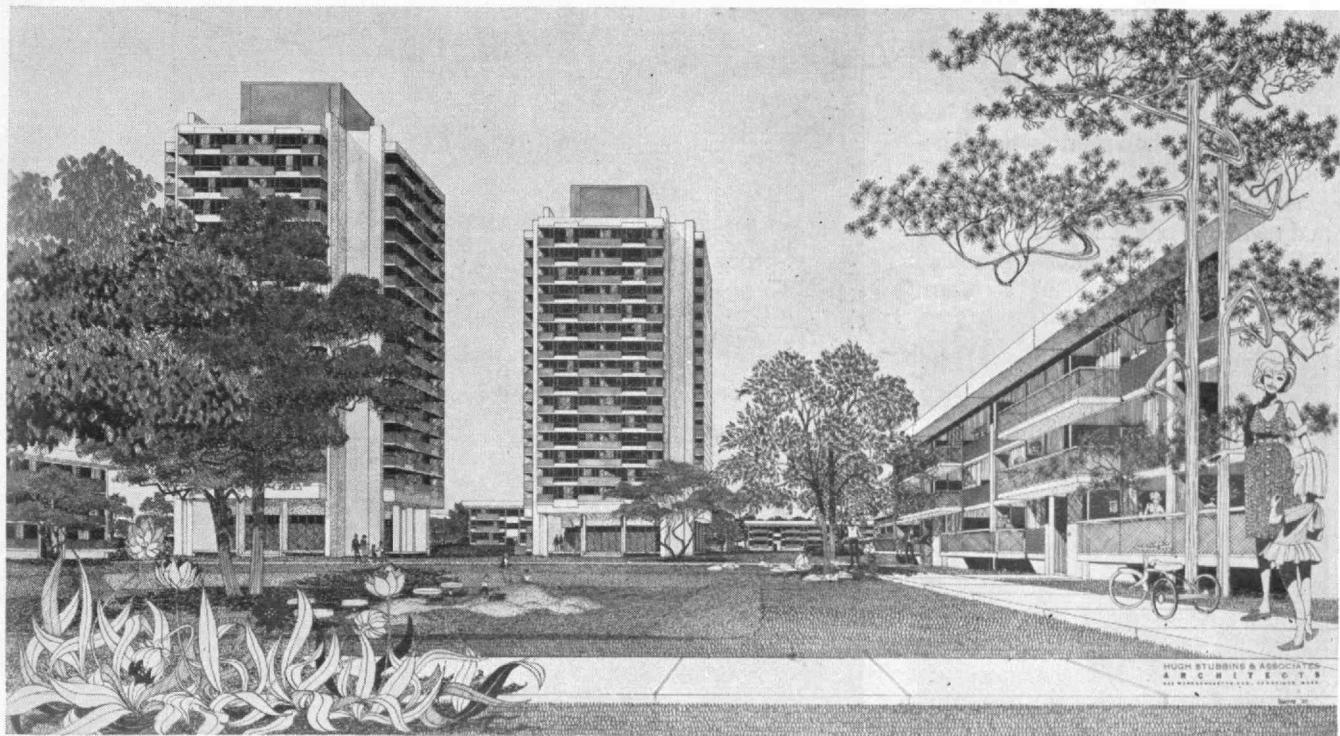
UNDER a new aid-to-education program, the Eastman Kodak Company announced grants of nearly \$250,000 this spring to 22 college and university graduate departments. They are intended, said Kodak's President William S. Vaughn, "to assist in the continuing search for scientific knowledge." Three such grants totaling \$37,500 were to M.I.T. for work in chemistry, chemical engineering, and physics.



CHEMICAL ENGINEERS are studying biological fluids now with an Instrumentation Laboratory device for measuring very small torques. Professor Charles S. Draper, '26 (left), presented it to Professor Edwin R. Gilliland, '33.

Alumni in High Places

TOP EXECUTIVES of the nation's 100 largest nonfinancial corporations, as listed last year by the First National City Bank, included alumni of 90 different institutions, according to the Council for Financial Aid to Education. Harvard led the list of these institutions and M.I.T. was second. Nineteen of the corporation executives had studied at Harvard and 10 at M.I.T.



FOR MARRIED STUDENTS, M.I.T. has begun construction of the buildings shown above. The first high building will have one-bedroom and efficiency apartments, and the low buildings will have two-bedroom apartments, each of which will have a balcony, for couples with children. In

addition to the customary facilities of an apartment house, there will be parking spaces, a baby carriage storage area, a variety store, and possibly a "well baby clinic" to help young mothers. The first units are scheduled to be ready for occupancy in the fall of 1963.

Parking Problems Solved

THE COMPACT VEHICLE trend and parking problems brought three unicycles into regular use at M.I.T. this spring—and so many students began striving to develop the human responses necessary to stay upright on one wheel that simply walking down a corridor became perilous at times.

Around and inside East Campus, Elroy Miller, '65 (front view), from Coquille, Ore., has become so familiar a figure on one wheel that no one glances twice at him—unless he happens to have a hitchhiker riding on his shoulders.

Another outstanding unicyclist is William Frazier, '62 (rear view), from Independence, Kansas, who commutes between his fraternity house across the Harvard Bridge and his classes daily. The unicycle he uses belongs to Thomas B. Sheridan, '59, Assistant Professor of Mechanical Engineering, and is rarely idle. Practicing on it in the corridors between classes, however, is now forbidden.

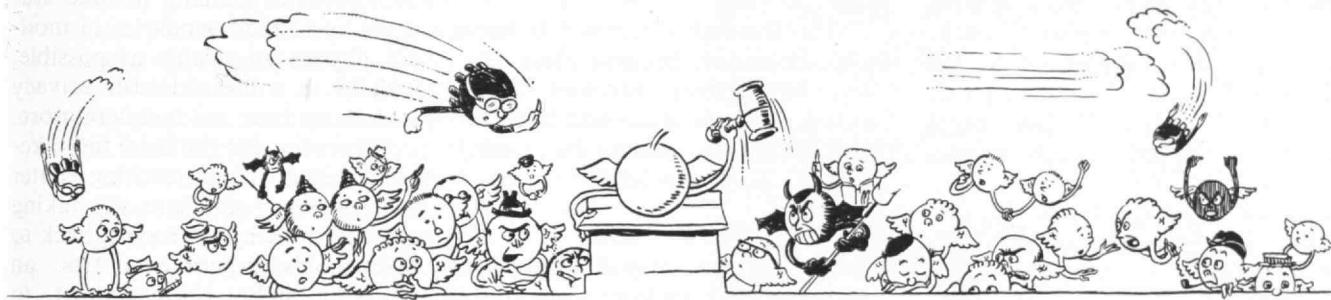
A third enthusiast for unicycling and owner of one is Michael Burton, '64, of Altadena, Calif.



The Protest from the Particles

The new Science Teaching Center at M.I.T. plans to make their secrets common knowledge—and they'll frustrate it if they can

BY PAUL STERANKA



THE CONVENTION will come to order! The convention will come to order!" the chairman shouts, rapping his gavel. Some delegates are caucusing on the floor, many are still scrambling for seats, and others are waiting patiently.

In the front rows of the hall are the molecule delegates, veterans of many conventions, noted for their centuries of opposition to human intrusion. Everyone instantly recognizes arthritic, jovial Water Molecule, known to his many friends as "good old H-TWO-O." Behind them are the atom delegates, with Hydrogen at the left and Uranium at the far right, and some of the isotopes are sounding off as usual.

But the turmoil is even greater in the rear among the basic particle delegations. The Neutrons are still arbitrating a dispute between the Electrons and Protons over the seating arrangements. The Anti-Xi-minus particle is weeping on the shoulders of older delegates about his recent exposure. The Neutrinos, cloaked in black costumes, are racing everywhere. Overhead the restless Photon delegates are hovering, listening to their leader, Red Light.

"I have received numerous petitions from you for this special convention," the chairman begins. "The most urgent pleas have come from our delegates in the rear, and I shall recognize them first. I sincerely

TECHNICAL WRITERS often are advised to think themselves into their readers' shoes. Paul Steranka, '60, thought himself into his subjects' shoes. Now working in the M.I.T. Instrumentation Laboratory, he contributed the article "A Day Beneath the Reactor" to the April, 1961, issue of The Review.

hope that the elder statesmen present will supply the paternal guidance and wisdom we will need. As you know, this is a secret meeting. No scientists or reporters are present, and you may speak freely.

"I see the neutron delegation is signaling. I recognize their leader, Thermal Neutron, I believe. Am I correct?"

"Yes, sir," a loud, shrill voice rings out and a group of Light delegates gather to spotlight the speaker. "I have the honor of representing my fellow particles in proclaiming a source of disturbance to us. Our presence and motion are no longer secrets!

"It was especially distressing to us neutrons when our existence was revealed despite our neutrality. But we are not the only victims of human curiosity. They exposed the velocity of the photons long ago, and more recently have disclosed even their particle nature. Electrons have suffered similarly—men now know the relativistic nature of their existence.

"At first, of course, few understood relativity and even fewer the principles. But since then the number of humans understanding the concept has risen alarmingly—and

now a group of humans at M.I.T.'s Science Teaching Center are working together to disperse our secrets more widely and more thoroughly. Let me be specific:

"Their Professor David H. Frisch and a Visiting Professor from the University of South Carolina, Anthony P. French, have devised a laboratory experiment for students to show relativistic effects. They use a beta ray source which emits a spectrum of relativistic electrons. By forcing the electrons to pass through a magnetic field, those of a specified momentum are selected from the spectrum and forced to travel along a particular curved path. By varying the strength of the magnetic field, they can obtain electrons with the momentum they desire. Then these selected electrons are forced to travel in a straight line by properly adjusted electric and magnetic fields. In this way, the velocity of the selected electrons is determined. Comparison of the momentum and velocity shows conclusively that relativistic theory describes the actual behavior of the electrons and that Newtonian theory is adequate only when the speeds are low. These fellows have made it so simple that

tudents cannot help but be convinced that relativity is real.

"If this sort of thing continues, our secrets will become common knowledge. On behalf of my colleagues, and the electrons especially, I protest!"

"Let me illustrate further. Consider what Professor William Berrozzi of the Linear Accelerator Laboratory has done. Experiments conducted with the accelerator have been put on film. They show more relativistic effects. In these experiments, more and more energy is put into electrons. The electron velocity is measured by time-of-flight methods and the energy input to the electrons is measured by the amount of heat dissipated. Despite being given greater and greater energy, the electrons refuse to exceed the speed of light. Viewers of this film cannot help but believe the theory of relativity! Is there no way to put a stop to this?"

The chairman points to the rear of the hall. "I recognize the spokesman for the electrons."

"Thank you, Mr. Chairman. I am just a simple, ordinary electron, but I would like to add another report to those which Thermal Neutron has given this gathering. He mentioned our concern over revelation of our relativistic characteristics. The problem is even deeper. Let me cite an example:

"A film soon will be released showing decisive evidence of our reality and motion. Professor John G. King, who directs this Science Teaching Center's experimental program, shoots electrons from a cathode-ray gun into a tube and focuses them on a small vane attached to a torsion balance. Regular, intermittent bursts of this electron beam build up the amplitude of oscillation of the vane until students can see it and measure it. From the parameters of the torsion balance, students can show that the forces necessary to produce the oscillation of the vane agree with those attributable to impinging electrons. Can you argue with such proof? I simply wished to add this example. Thank you."

"Mr. Chairman! Mr. Chairman!" a voice rings out from the large atom ensemble.

"I recognize the spokesman from the Tin delegation," acknowledges the chairman.

"Mr. Chairman, I sympathize wholeheartedly with the basic particle spokesmen. The Tin atoms have been subjected to similar harassment. Our preferred arrangement in crystals has long been divulged and we have become accustomed to it. But now we feel we are being unduly humiliated. Alan N. Holden, who is a visiting professor at M.I.T. from Bell Laboratories, and Professor John F. Cochran have devised a simple technique with which freshmen are growing crystals. Some of their single tin crystals are two feet long!

"The Bismuth delegation is likewise concerned, because these fellows have grown two-foot single crystals of them also—and hope to have freshmen doing the same. Where will all this lead?"

The Voice of Experience

"Mr. Chairman, may I speak?" a deep, firm voice up front speaks out.

"I recognize the distinguished Oxygen molecule," says the chairman, "and I would advise all of you to pay close attention."

"I have been a delegate to these conventions for a long time," Oxygen reminisces. "I have witnessed the revelation of most of the secrets of the multitude gathered here. I can even recall when I was once indignant over the discoveries concerning myself. Time erases all pain and I can honestly say no pain remains in me. I am as common as . . . Well, I am just plain common. Oxygen has been analyzed, synthesized, destroyed, produced, and yet, oxygen molecules are still among you."

"I have listened carefully to the words passing over my head at this convention. I can recall similar lamentations on innumerable other occasions; only the details have changed. It is humiliating to be understood by humans, and their discoveries are blows to our pride, but we particles can withstand such blows. We have endured them without flinching in the past, and this is no time for cowardice."

"The reports we have heard today, however, have raised a disturbing thought in my mind, and I cannot help but recall the words of that great particle Hydrogen who warned us long ago that eternal vigilance is the price of privacy. We have adapted ourselves successfully

to being understood by a few humans, speaking to each other about us in terms which only they understand, but can we endure being understood by every Tom, Dick, and Harry who gets into college?

"Science teaching, as everyone here knows, has followed the same lines for several decades; the students have been required to learn classical physics first, thus delaying their introduction to modern physics. This has given us plenty of time in which to take evasive action. Now, at this Science Teaching Center, they are planning to take students up to the boundaries of modern physics as quickly as possible, and this is a threat to our privacy such as we have not met heretofore."

"Consider, for instance, the take-home kits that this teaching center has developed. Students are taking away from their classrooms, back to their rooms, experimental kits: an optics kit and a resonance kit, to date. Consider the effect these kits will have on students who are free to experiment at their leisure. These are not just toys. The laws of optics and resonance are at the very heart of our private lives. Letting students study them in this new way can have serious repercussions."

"Now suppose other branches of science, chemistry, geology, biology, and so on, join this endeavor. Consider the implications of spreading present-day knowledge of many sciences far beyond the walls of laboratories. This has occurred to the Center's Director, Professor Francis L. Friedman, and his associate, Professor Nathaniel H. Frank. This is what some of the personnel of this center are dreaming of instigating. They have the support of M.I.T. and the National Science Foundation."

"I honestly cannot foresee what will happen when the number of engineers and administrators who understand us has risen. Some day, possibly even the artists and poets will stop letting us go our way while they go theirs. What will we do then?"

"Human control over our actions, to date, has not really bothered us. We have enough modes of existence, and there are so many of us, that we are still free to do pretty much as we please. But suppose the masses as well as the elite of human society begin to understand us? There might be such an accelera-

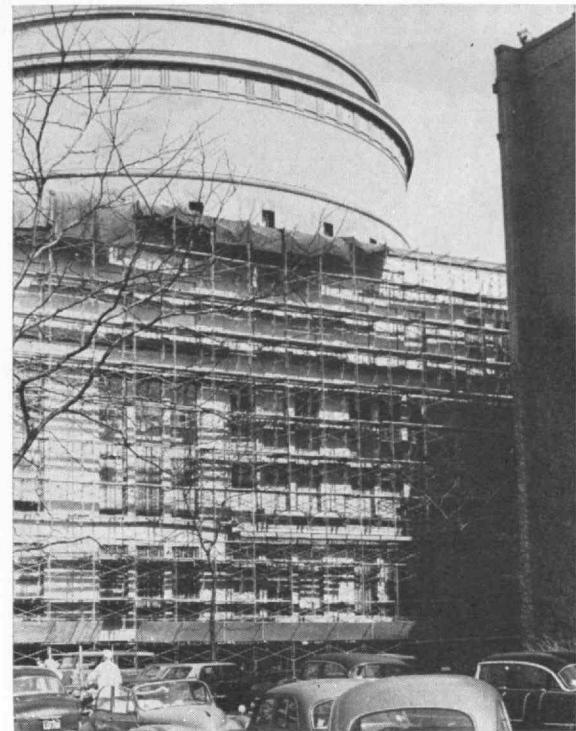
Alumni Will See Relativity Proven

ON JUNE 11, this year's Alumni Day at M.I.T., visitors will see both

- 1) the largest construction program undertaken at the Institute since 1916, and
- 2) experiments such as Mr. Steranka cites in his article, "The Protest from the Particles."

They will see demonstrations of work in high-speed photography, the life sciences, and aeronautics and astronautics. They will participate in a demonstration of light interference phenomena, perform an experiment proving relativity, and have a chance to use one of the new electronics kits with which students are working.

The customary Alumni Day luncheon will be held in the Great Court, there will be a social hour on Briggs Field, and the Alumni will then dine with classmates in the Rockwell Cage.



tion of what they call progress that a question will arise as to who is the master."

Oxygen's words stun the assemblage, and even the chairman meditates a few minutes before rising.

"You have raised some very sobering points, Oxygen," he begins, "but are we not overlooking basic principles? We are governed by fundamental laws. Have humans ignored them? Can you honestly say that our government has been jeopardized? I know that our laws still stand, and that any request from humans that is in accordance with them is reasonable."

Even Time Will Be Exposed

There is a sudden stirring in the rear of the hall. Heads turn, feet shuffle, and there is a hush as an unexpected delegation, enters.

"Mr. Chairman," its leader says, "we are known as the Cosmic Rays."

"Enter the visitors' gallery to my left," the chairman replies, "and state your case."

"We, too, wish to protest what is going on in the Science Teaching Center at M.I.T.," the Cosmic Ray's leader bellows. "Our existence has been shrouded in mystery except in some isolated cases. But now that fellow Dave Frisch and a Visiting Professor from Illinois named James H. Smith are conducting an experi-

ment to illustrate the relativity of the passage of time! And they are using us as the means!"

"How many people now know we are streaming by them in large numbers every day? How many know that if they would only look at us they would see that our time system is operating slower than theirs?

"Now hear this: these M.I.T. fellows have assembled 13 tons of iron in a laboratory just to pick certain ones of us out, and they plan to cart 13 tons of iron to the top of Mt. Washington for the same purpose. They'll count the fraction of us decaying with their scintillation counters on Mt. Washington, 6,000 feet above sea level, and in their laboratory at M.I.T., and find the two results differ. This difference is attributable to the number of us who decay as we rush through 6,000 feet of air down to sea level.

"Knowing our half life, they can calculate the time period necessary to produce this difference. However, since we decay in our time system, this will be the time as measured in our moving frame of reference. Knowing that our velocities are close to those of the photons overhead, they can calculate the time interval it takes us to travel 6,000 feet. That time interval will be the time as measured in man's system. Since

the two time calculations will differ by a factor of about four, they will have evidence that our system of time and their system of time are different.

"This has been done before—by Professor Bruno Rossi, in fact. But these fellows are setting up an experiment to be put in a movie. The facts will be widely shown. Can't something be done to prevent this widespread exposure of our time system?"

Delegates begin to demonstrate wildly, and the chairman bellows: "Will the sergeants-at-arms clear the aisles? Clear the aisles, please!"

"It's the Neutrinos," a Hyperon booms from the rear. "They want to be heard."

"Enough of this futile talk," says a penetrating voice. "Are we particles or are we waves? The time has come for action. There will be a meeting of men who support and encourage M.I.T. and its Faculty in June. Every year they have what they call an Alumni Day, and those fellows in the Science Teaching Center are scheduled to reveal their plans then. Here's what we can do. If we . . ."

(All the particles began to talk at once at this point, raising the noise level so high that it has been impossible thus far to decipher the rest of this dispatch.)

Models Aid Tomorrow's Builders

BY ROBERT J. HANSEN, '48, AND WILLIAM A. LITTLE, '57

DR. HANSEN is professor of structural engineering and director of the Laboratory for Structural Models

that is the subject of this article. Mr. Little is a teaching assistant in the M.I.T. Civil Engineering Department.

ALTHOUGH models have been used for many purposes in engineering and science, their application to the building design problem has been slow. Interest in the model approach as an aid in the design of buildings, and to a lesser extent, in other types of civil engineering structures, has recently risen sharply at M.I.T.

The Perini Memorial Foundation, Inc., of Framingham, Mass., has granted \$250,000 to the M.I.T. Second Century Fund to establish the Laboratory for Structural Models.* This laboratory, which will be jointly operated by the Departments of Architecture and Civil Engineering, will profoundly influence the teaching and research programs of both Departments.

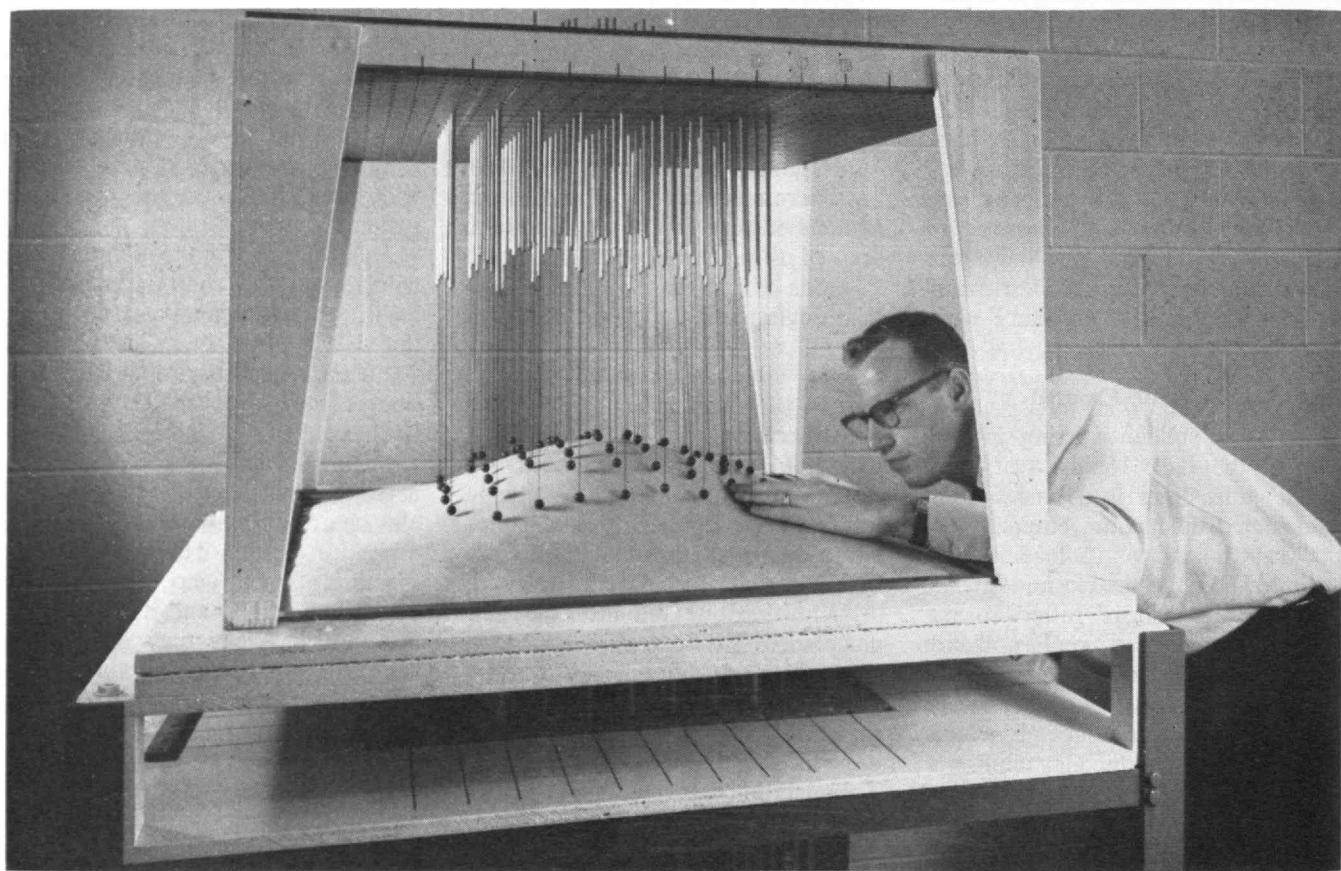
The Nature of These Models

A building structure is an integration of basic structural forms, e.g., the cable, the beam, the truss, the column,

* Technology Review, January, 1962, page 11.

the arch, the plate, and the shell. A designer confronting a particular enclosure or spanning problem has certain materials and structural forms available. His task is to combine them in some aesthetically pleasing, functionally satisfactory, and structurally sound way at a reasonable cost. These materials and forms can be combined in a myriad of ways in any particular problem. To evaluate a proposed solution, however, the designer must ask himself whether the structure will have sufficient *strength* and, quite separately, sufficient *stiffness*, to meet environmental conditions to which it will be subjected. To answer these questions he needs some means of predicting the proposed structure's response when it is subjected to wind, snowload, temperature changes, dead load, live load, etc.

There are three basic methods of evaluating structural response: analytic, experimental, and a combination of these two. The advantages and disadvantages of each method depend on the problem. It is the design-



This table is used to secure a desired three-dimensional shape on which a mold can be cast for the preparation of a

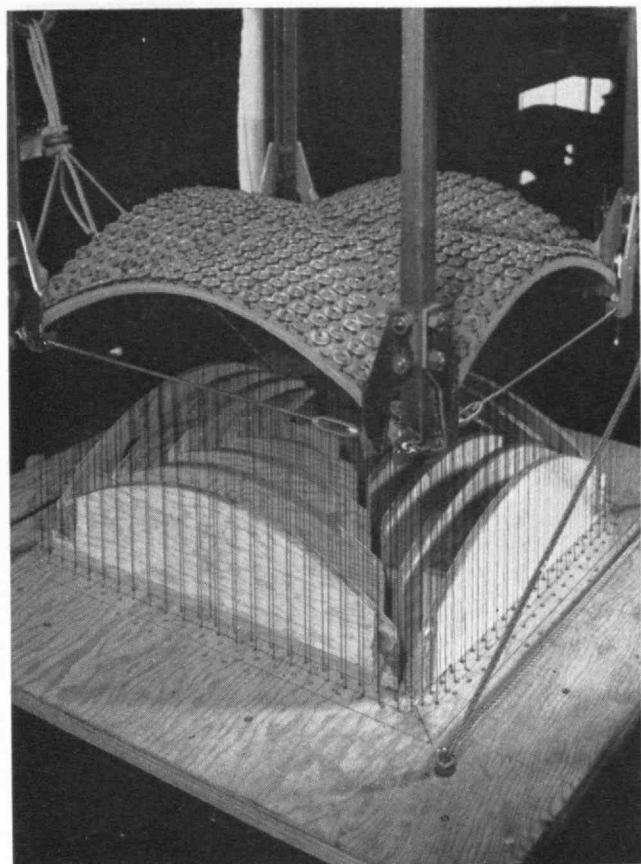
model shell. There is a layer of sand between two rubber membranes which can be stiffened by removing air from it.

New laboratory's new techniques help designers, researchers, and students in two M.I.T. schools.

er's responsibility to understand these methods because, if he does not, his creation may be compromised needlessly.

Analytic techniques generally are based on the theory of elasticity. An assumption of linear proportionality between stress and strain is inherent in this theory, although our understanding of behavior beyond the elastic range up to and including failure has been improved recently. While extremely useful, analytic treatments have serious limitations with regard to plates and shells, and in structures in which basic forms are combined in complex ways. Often these more complicated structures have high aesthetic or functional values.

Principles of similitude (or dimensional analysis) are a basis of all experimental design. By adhering to them, one can study a reduced scale model even though the material in it may be different from that used in the prototype structure. The principles of similitude are really relations between dimensional units, and an ex-

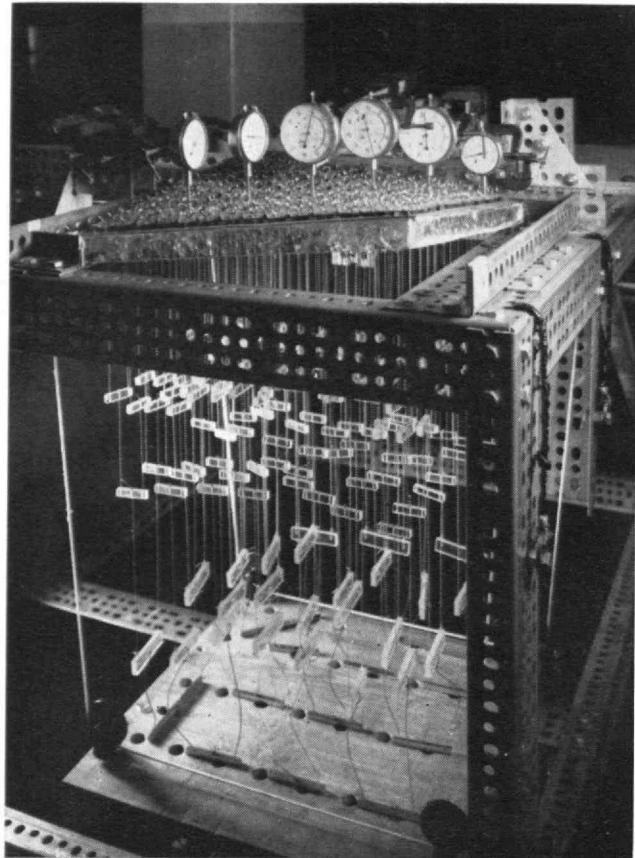


This model was used to study the design of the groined-vault, thin-shell roof of the Providence, R. I., Post Office.



The shell thickness and the size and location of the ribs to preclude buckling in the roof of this impressive structure

were arrived at with the help of 1/80 scale models pressed from polyvinyl chloride in M.I.T.'s models laboratory.



Samuel Lee, '62, studied deflections in this hyperbolic-paraboloid shell. Weights are on strings through whiffle trees.

perimenter may freely choose from parameters (e.g., scale or material) for his model. After a certain number of free choices have been made, however, the other parameters (e.g., temperature or time relations between model and prototype) are fixed by laws of similitude.

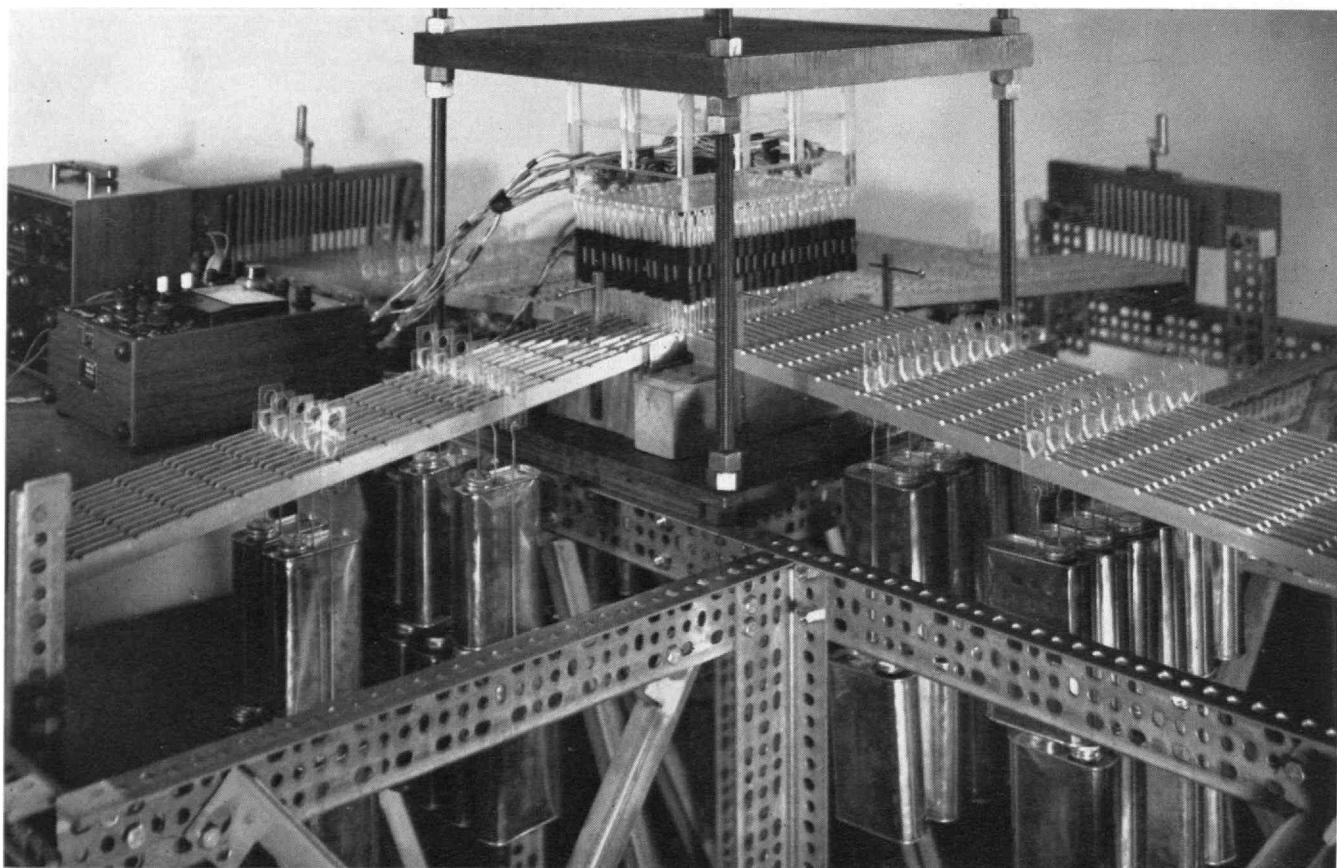
The latitude which these laws allow makes models useful means of determining (1) gross internal forces (moment, shear, and thrust) at particular cross sections; (2) the stress distribution over a cross section; (3) deformation patterns and modes of failure; (4) buckling loads, and (5) vibration characteristics.

The disadvantages of the model technique are quite different from those of the analytical method. Whereas an engineer using analytic techniques may find that assumptions which have little or no justification are necessary to apply theory to the analysis of a certain structure, he may find modeling techniques too costly and time consuming even though reliable information can be obtained by employing them.

Modeling Techniques

There are now several significant model laboratories, notably the National Civil Engineering Laboratory in Lisbon, the Laboratorio Central de Ensayos de Materiales de Construccion of Madrid, the Istituto Sperimentale Modelli E Strutture of Bergamo, Italy, the Cement and Concrete Association Laboratory in Slough, England, and the Portland Cement Association Laboratory in Skokie, Ill. All of these laboratories have undertaken studies of building structures, but the emphasis in their work generally has been on other types of structures.

(Continued on page 48)



This is a plexiglas model of a reinforced concrete beam-floor system being studied for a major building. Scale is 1 to

200. Cans hanging below four sets of bars contain stainless steel punchings and simulate column loads on the beams.

Our New Kind of Evolution

"Thinking machines" differ from our brains, but are becoming like them in some respects and may determine the future of our species

BY JOHN PFEIFFER

MOST SCIENTISTS professionally concerned with nerve-cell and electronic circuitry would agree with a statement made by a man who has thought deeply about both kinds, Warren S. McCulloch of M.I.T.'s Research Laboratory of Electronics: "The brain is like a computing machine, but there is no computing machine like the brain."

Perhaps the most significant difference is that the electronic computer is not creative in any basic sense. It does not perform the original thinking which keeps it busy. It does not conceive the models it analyzes or the nature of the patterns it seeks and finds. It must be fed ready-made problems and ready-made purposes.

What computers may do in times to come is something else again.

The brain was not constructed according to engineering principles. It is a strange combination of ancient and recent structures, something like a house built on a prehistoric foundation—with Gothic rooms on the first floor, a colonial-type second floor, and a roof which is partly thatched and partly a mixture of Victorian and modern styles. From the lowest to the highest levels, from brainstem to cortex, nature has retained many structures evolved in primitive creatures and laid down one above the other. Computer engineers do not retain old circuitry; they can start from scratch.

Engineers would like to match the brain in at least one respect—and their efforts are just beginning to pay off. Present-day calculating machines compare with brains as dinosaurs to mice; future models will be far more compact. Enormous strides are being made in methods of cramming more and more hardware into less and less space.

The New Memories

The memory units in most modern computers, wafer-thin magnetic cores about a twentieth of an inch in diameter, are so small that you could pack nearly a quarter of a million of them inside a single tube. But magnetic cores have already been surpassed. The newest machines have even more compact storage devices.

These superminiature elements are manufactured by placing sheets of glass in the upper part of a vacuum chamber, where iron-nickel and other magnetic alloys are turned to vapor at high temperatures. The fumes rise through a "mask," a metal strip with small round holes punched in it, and deposit themselves on the surface of the glass sheet in a kind of polka-dot formation. The process, which was originally developed to cover telescope mirrors with even aluminum coatings, is something like spraying paint through a sieve with a

JOHN PFEIFFER has long been one of America's best-known popularizers of science and won the Westinghouse Prize for his work last year. This article was drawn from his new book, *The Thinking Machine* (J. B. Lippincott, \$5.95), which in turn was based on a CBS News television program produced in connection with the observance of M.I.T.'s Centennial

spray gun. You end up with a sheet of regularly spaced, film-thin magnetic dots.

The dots of a so-called "magnetic film" memory unit serve the same purpose as magnetic cores. They can store bits of information, binary 1's or 0's depending on the direction of magnetization. But each film dot may be only a fiftieth of an inch in diameter and four-millionths of an inch thick, which means it is about 10,000 times smaller than a core. This is comparable to compressing an office file cabinet down to the size of a pillbox. Investigators at M.I.T., Remington Rand, and other places have contributed actively to the development of the new magnetic-film techniques.

Looking further ahead, the ultimate size of storage devices seems to be limited only by the sizes of molecules themselves. Individual memory elements may be expected to shrink to microscopic and then to sub-microscopic and ultramicroscopic dimensions. Computer experts will be consulting more and more frequently with biologists and physical chemists, taking hints from the design of genetic mechanisms in the nucleus of the cell. It requires no particular gift of foresight to predict synthetic DNA-type molecules—synthetic memory traces for synthetic brains—which carry hundreds of bits of information for every millionth of an inch of their lengths.

Crystal "Cooking"

The very notion of individual parts may have to be modified. Engineers are already thinking in terms of molecular regions, regions within the volume of a single crystal which serve special electronic functions.

Crystal-making, in the words of one investigator, "has become a highly developed art, like French cooking." The main ingredient may be a pure metal to which you add carefully measured dashes of other chemical elements. The result is a crystalline block through which electricity may flow. The block is not of uniform composition throughout, but contains different sites so arranged that current passes from one to another along a specified course—a complete circuit built into a jewel. Such crystals can do the work of and replace many conventional components. Using them for

computers and other electronic devices is like building a home out of a few prefabricated units instead of thousands of individual parts.

Another coming feature is a thin-film circuit designed to operate at extremely low temperatures. Under ordinary conditions you need voltage supplied by a battery or generator to keep current flowing. But at temperatures down around absolute zero metals acquire an amazing property. They become "superconductive," i.e., their resistance to the flow of current vanishes. Once a current is set up in a metal ring it will move in merry-go-round circles indefinitely, without any source of voltage to drive it. This is roughly equivalent to making a car with frictionless wheels, a motorless car, which after an initial push, rolls along on its own forever or until you apply the brakes.

When Inches Count

As tactics and strategies become increasingly complex, computers must also become more complex. They are called on to handle more difficult problems, which means more elaborate circuitry and more parts. For example, take mobile "intelligence" or deciphering devices for use in combat areas. You want them to solve intricate ciphers without adding to their weight, so there is a constant race between the men who conceive new ciphers and the men who make electronic components. Another advantage is that small parts often tend to be more reliable.

Speed is also a significant factor. The direction of the magnetic field in a thin-film dot can be reversed faster than the field in a core, so you can extract or store information faster. Furthermore, you can save time because smaller parts can be put closer together. If two parts are separated by one foot, an electrical signal moving at the speed of light takes about a billionth of a second to negotiate the distance between them. Now it may not seem like much of an improvement to decrease that time by decreasing the distance to, say, a hundredth of a foot. But when you take into account how many signals and how many different channels are involved, the difference can be significant.

An analogous situation would be to make a road shorter between two neighboring towns. Eliminating a few curves might reduce the driving time by only a few minutes or so. But if you add up the time saved after

Character Recognition Experts

Oliver G. Selfridge, '45, of M.I.T. Lincoln Laboratory, gave the keynote address at a recent symposium in Washington on Optical Character Recognition, attended by more than 800 computer workers. Alumni participants in the meeting included Carl Barus, '48, who presented a scheme for recognizing patterns from an unspecified class; John B. Chatten, '50, who described an address reader being developed for the Post Office Department; Dwight M. B. Baumann, '57, whose subject was area-weighting techniques; Wilbur H. Highleyman, 2d, '57, who dealt with categorizers used in a pattern recognition system; and Lawrence G. Roberts, '59, who reviewed developments in character and pattern recognition at M.I.T.

thousands of round trips, the total may amount to many man-years—and similar savings are made by using tiny electronic circuits.

Baseball Questions

But small parts by themselves will not raise the "IQ level" of a computer. The big job still falls on those who tell it what to do, who prepare orders for it to follow. A machine's capabilities, like a child's, depend on the quality of its instructions—and the future is certain to see revolutionary developments in programming.

A group of Lincoln Laboratory investigators is working on a unique question-answering program. The study should be of interest to baseball fans, because a computer will have its memory filled with information about the locations, dates, and scores of all games played during one American League season. It will answer thousands of questions like "How many times did the Red Sox lose by a run two days after the Yankees beat the Indians by a run?"

The program will also enable the machine to respond to "noisy" questions whose meanings are not clear. Confronted with such vagaries, the computer will ask a question of its own: "What do you mean?" It will continue asking until you prepare a reworded and unambiguous question.

Working with such a computer would be something like playing tennis with a player worthy of your mettle; working with present-day computers is more like batting a tennis ball against a wall. Your problems come back at you rapidly, but you learn little about improving tactics and strategies and the finer points of the subtle game of problem-solving. Research is under way at several laboratories to develop rapid, two-way communications about problems between men and machines.

Recognizing Letters

Two pattern-recognition projects at M.I.T.'s Lincoln Laboratory indicate the sort of improvements that may be possible. In one the computer is programmed to recognize hand-printed letters of the alphabet by a complicated and detailed procedure. Every letter is examined for 28 characteristics—the number of horizontal lines, the number of vertical lines, the presence and locations of unenclosed spaces, and so on. Then different letters are compared for each one of the different characteristics and identified accordingly. This system works, but it works slowly. Furthermore, it recognizes only 10 letters, and it would require far more time and circuitry to identify the whole alphabet.

The second project involves the same objective, but a different system. Imagine a device designed to recognize four and only four letters—say, *A*, *O*, *X*, and *E*. It has a reading unit consisting of a mosaic of 64 light-sensitive phototubes, and when the image of a letter registers on the mosaic, the affected phototubes respond by producing signals representing the patterns they "see." The mosaic is divided into 16 four-tube blocks, each being wired to a separate information-analyzing unit which receives all the signals from its phototube block. That gives us an array of 16 analyzers handling data from different areas of the mosaic.

There is one more step in the system. The analyzers in turn are wired to a second array made up of only

four special units. These units are the executive elements. Provided with information from the other elements of the device, they have the final say-so when it comes to identifying the observed letter. The wiring is arranged in such a way that if the combined signal patterns from the analyzers represent the letter *X*, only the *X* unit in the last array will fire. So when one of the four decision-making units emits a signal, it is in effect naming one of the four letters which the device is designed to recognize.

The Lincoln Program

This is a simplified version of a system which is actually being tested on the TX-0 and TX-2 computers by Lawrence G. Roberts, '59, of the M.I.T. Lincoln Laboratory. The program he prepared describes a mosaic of about 1,300 instead of 64 phototubes, an array of 288 analyzers instead of 16, and a second array of 44 instead of four executive units. In other words, he has programmed the machine to recognize as many as 44 characters. Furthermore, he includes a reward feature so that the machine receives a reinforcing or "encouraging" signal every time it makes a correct identification during its learning period.

Brain investigators are particularly interested in Roberts' project, because it represents a device resembling the brain in certain important respects. The image-registering mosaic, of course, is a kind of sense organ. The 1,300 phototubes in it may be regarded as electronic versions of the light-sensitive cells in the retina of the eye. The analyzing and executive units correspond to nerve cells, and the arrays in which they are arranged correspond to nerve-cell layers in that part of the cortex concerned with vision.

Models of Humans

The design of future machines will benefit from the findings of brain investigators, and the reverse also holds true. Brain investigators will consult with computer specialists to gain insight into the workings of the nervous system. The use of computers to simulate nerve-cell networks is just beginning, and if the machines can run models of floods and stars and political systems, you can be sure that sooner or later they will deal with models of brains and human beings. They represent the most powerful tools yet developed for the study of human behavior.

Computers will also find wide application in helping us to train our brains more effectively. They will serve as teaching aids, and it is only a matter of time before they will be at work in every large school. Even ignoring the fact that teacher shortages will become more critical, the situation is bad enough right now. For one thing, teachers can rarely provide the degree of individual attention which their pupils need.

Some day much of the information will be imparted with the assistance of computers. Teaching machines already exist which present material to students, ask questions about the material, and check the answers. Moreover, some machines do not present the material in the same order to every student. The order depends on the answers of the individual student, and if he happens to have difficulty grasping certain ideas, he will be confronted with additional information and questions from the machine.



Working with a computer now is like batting a tennis ball against a wall. Will future machines be worthier opponents?

Now think of a computer connected with 20 or 30 such machines, each working with a different student. It can monitor the entire situation. It can receive information about all the progress of all the students, analyze and compare records, and evaluate the effectiveness of different ways of presenting information. It can bring learning problems to the attention of the teacher, who will have time for individuals requiring special help.

More Than a Revolution

All this is part of a process that started at least two or three billion years ago when living things somehow arose out of sunlight, water, and dissolved minerals and crystals and gases. Ever since then animate matter has been organizing itself into more and more elaborate forms, among which man is the most complex.

The rise of computers has been called a second industrial revolution, but it is far more than that. It is the mark of human development, a sign that our kind of evolution is just beginning. We are uniquely designed to obtain and analyze information, and not only the ready-made information accessible to our natural sense organs and to the sense organs of other species. We go after new information, and all that we have discovered to date is nothing compared to what we shall discover.

All our past explorations are merely practice for explorations yet to come, like a baby crawling before it walks. Our skies will soon be filled with satellites: flying telephone and television receiver-transmitters, flying telescopes, flying radar and radio astronomy stations, flying laboratories and launching platforms. Every device will be recording enormous quantities of information to help us build extensive communication networks for growing populations—and vehicles for ventures into interplanetary space. We need machines to help us make sense of this flood of new information.

The evolution of all other living things has depended on changes in their bodies. But man could evolve indefinitely without any such changes, with the same brain he has now. Our kind of evolution depends on cultural changes, on what we learn, on the things we build. In a basic sense, human evolution *is* the evolution of machines, and of these, computers are the most significant. Perhaps more than anything else, the design of artificial-intelligence systems will determine our future as a species.

Books

THE LEGACY OF HIROSHIMA, by Edward Teller and Alan Brown; Doubleday (\$4.95). Reviewed by Cyril S. Smith, '26, Institute Professor at M.I.T.

THIS is a very timely book, but it will hardly put an end to discussion of the topic with which it mainly deals—the nuclear policy of the U.S.

The book is in four parts. Part 1 is a Tellerian history of the development of the A-bomb during World War II with particular emphasis on Los Alamos, followed by a chapter on the H-bomb program of the U.S. with the ill-fated 1949 decision of the General Advisory Committee, bitterly opposed by Teller and eventually reversed by a combination of technical and political factors. Part 2, on the general impact of science on civilization, contains a section entitled "How to be an optimist in the nuclear age," e.g., enjoy the fact bombs could be put to use in producing harbors and perhaps for producing piscatory mutations which would have higher food values and would co-operate in their catching. There is a chapter on nuclear power and the uses of radioisotopes and one on space—with the suggestion that a war for the freedom of space might be fought entirely with satellite and anti-satellite, an interesting and harmless way of using excess productivity and engineering imagination (at least until the space dominance of one side forces the other to terrestrial measures); but Teller wisely concludes that the "kindling of young curiosities may well be the most important consequence of our adventure into space." On education, Teller advocates a minimum of formal preparation and a maximum of special activities to allow each child to find his special interest and areas of excellence and develop them with unhampered enthusiasm. Teller argues strongly for eventual world government, but it is hard to see how his immediate nuclear policy would promote the international understanding that is a necessary prelude to this. As subsidiary objectives, he proposes the adoption of the metric system and simplified spelling in the English-speaking world. Almost as a refrain through the book goes argument against excessive secrecy, and an entire chapter is devoted to this. In all of these parts, one feels an intelligence, aliveness, and forward-looking imagination, coupled with a desire to use human capabilities to the full that makes one deplore that such abilities have been used predominantly for the narrow objective outlined in the first chapters.

There are few topics that currently evoke more emotion than the further development of weapons of mass destruction, and outbursts by "experts" on one side naturally provoke outbursts on the other, leaving the average citizen puzzled and uneasy. Teller's main argument is that we have more to fear from unpreparedness than from nuclear war itself, and he scoffs at most of the points that have been advanced by those who want testing banned and the nuclear arms race stopped.

He is right in trying to allay hysterical fear of fallout, and is literally correct in stating that we may never exactly know (i.e. measure over background) the biological effect of fallout from a few tests. Fallout can hardly be as bad as has sometimes been claimed; some people would survive any war, and the number would increase in some proportion to the amount of effort spent on advance planning of shelters: it is also true that we could eventually reconstruct, if not in the three years that Teller blithely implies. It may even be that an infinitesimal fraction of radiation-induced mutations are beneficial, but surely, in the present state of genetics and social organization, the following is about as immoral a statement as has ever been made by a sensitive human being: "Deploring the mutations that may be caused by fallout is something like adopting the policies of the Daughters of the American Revolution, who approve a past revolution, but condemn future reforms." Teller makes no attempt to discuss the statistical nature of fallout damage, with its rare, but nonetheless individually catastrophic, effects, and he shows no awareness of the moral problems which must be faced squarely in our decision to risk (indeed, guarantee) damage to other people in order that we may gain a temporary advantage in "deterrent" power. It is the simplicity of Teller's approach which is horrifying. It is tragic to see one of the most able and once most human of scientists, who obviously has a passionate concern for freedom and who sketches a marvelous future, advocate as the beginning of the road toward it an enhanced dependence on the technology of weapons. In attacking the Hiroshima-derived hysterical fear of nuclear weapons, he approaches a similarly illogical fear of Communism.

The book deserves to be widely read as it doubtless will be. As a glimpse of the future, it is truly inspiring, but it must be read critically for it provides a better example of a current problem of the role of scientists in public affairs than it does a guide to the solution of international tensions.

THE RAILWAY REVOLUTION—GEORGE AND ROBERT STEPHENSON, by L.T.C. Rolt; St. Martin's Press (\$6.50). Reviewed by John B. Babcock, 3d, '10, Professor of Railway Engineering, Emeritus, M.I.T.

IN THIS book, Mr. Rolt has traced the revolution in transportation in England within three decades (1830-1860) through the professional careers of two men, George and Robert Stephenson—father and son—who were in large measure responsible for it. Prior to 1825, there had been limited use of trackways (principally near the coal mines) with vehicles hauled by horses or occasionally by rope haulage from fixed engines. But with the advent of the steam locomotive, historically dated by the success of George Stephenson's "Rocket" in the famous Rainhill Locomotive Trials of 1829, a complete transformation took place which resulted in a network of railways throughout the British Isles within the next 30 years.

George Stephenson (1781-1848) lacked formal education, but he had an astonishing grasp of mechanical principles and was able to apply James Watt's discovery of steam power and Richard Trevithick's develop-

(Concluded on page 46)

Ingenuity: A Quality of Victory

There's hope for the world if we encourage it; men under stress sometimes come up with ideas

BY LUIS DE FLOREZ, '11

THE INGENIOUS MAN, the ingenious organization and the ingenious nation—other things being equal—have the best prospect for survival and success in the world today.

Ingenuity is not easy to define. But we recognize it or its lack on every hand. It appears to be an extraordinary combination of imagination and nonconformity, which produces a way to attain an objective, usually despite inadequate means or adverse circumstances. Inventiveness, resourcefulness, and the ability to improvise, to meet the unforeseen are characteristics of ingenuity.



Photo by Joe Covello, Black Star

Rear Adm. Luis de Florez USNR (Ret.), '11, truly needs no introduction to M.I.T.'s Alumni and friends. In the February, 1962, issue of Nation's Business he discussed his experiences in one of that magazine's series of articles on "Qualities of Victory." This article was condensed from Nation's Business, copyright 1962.

How can we come by this great quality of ingenuity? Is it inherited? Can it be developed? The answer is that some people are born with more natural ingenuity than others. Most of us can develop this characteristic to a greater or lesser degree through necessity.

I have seen men under stress come up with ideas that would never have occurred to them under ordinary circumstances. Certainly necessity is a spur to ingenuity whether inherited or developed. It is not always possible to identify the ingredients of motivation, but certainly some motivation is needed to make us scheme, plan, and struggle to achieve our objective.

Being primarily an engineer I find difficulty in describing the mental workings that produce success through ingenuity for a lawyer, doctor, poet, politician, or business manager. But for what it may be worth, I can describe the working of my mind in arriving at a mechanical invention which I treasure, for, in its time, it saved many lives and much equipment.

For many years I specialized in the design, construction, and operation of refinery equipment, particularly in cracking units in which petroleum was treated at temperatures on the order of 1,000 degrees F. and under 600 to 800 pounds pressure per square inch.

I had just put into operation a battery of such stills for the Gulf Refining Company in Port Arthur, Texas, when a new oil field was discovered in West Texas. The oil from this field was far more corrosive than anything previously processed, and we began to have trouble with what became known as "spotty corrosion."

This type of corrosion took place irregularly inside the piping. Some parts were virtually unaffected while others pitted dangerously. The danger lay in the inability to find all such weakened spots by inspection. This raised the growing specter of a major failure and consequent explosion.

One night on one of many periodic visits to the plant, I had just spent several hours with the night shift and subsequently had gone to bed. Suddenly, I was awakened by a dull roar. Through my window I saw the dreaded glow of fire in the location of my battery. I stumbled into my clothes and rushed to the scene.

When I arrived, I was told that a vapor line had let go, doubtless due to spotty corrosion, and hot vapors under high pressure had poured out, blanketing the battery. The stillmen, my friends, without thought for themselves, had rushed to the fireboxes to shut off the burners to avoid ignition instead of running away for their lives. It was of no avail. The vapor fired in the hot furnaces and the men had been burned at their posts.

To this day I remember the shock and pain at losing the men I had worked with for months and the surge of anger at our helplessness in solving this elusive corrosion problem that had caused the explosion.

As I left the battery in the early light of dawn, I passed by a water pump which had been rigged to protect other equipment and saw against the brightened sky a thin spray of water squirting through a pinhole flaw in a cast-iron fitting. At once the answer came to me and stopped me in my tracks.

If I drilled a minute pinhole at regular intervals in our piping, part way through the wall of the pipes, any spot of corrosion which occurred nearby would eat through to such holes and a minor leak of vapors would occur and be noticed immediately.

The still could then be shut down while the piping retained an adequate factor of safety.

After that, all our piping was drilled. Other companies followed suit. This became known as "safety drilling" and spotty corrosion lost its terror. Nothing I've ever done has given me more satisfaction. My only regret was that I did not think of it sooner. On the other hand, I might never have thought of the solution to the problem had it not been for a great emotional shock and that flaw in the cast-iron fitting.

Ingenuity tends to be associated primarily with science and technology. Certainly we have seen an ever increasing and dramatic progression of scientific marvels to harness nature's energy and make for better living. Actually, it is a major ingredient of success in every human activity.

We have today a priceless heritage bequeathed us by those who struggled ingeniously as well as laboriously to conquer the wilderness and create our way of life. This heritage, great as it may be, is not indestructible.

The struggle for the mirage of security rather than adventure, for working fewer hours rather than making greater progress, the tendency to stifle private enterprise and to penalize the successful are manifestations of corrosive forces threatening our future survival.

An Experiment at M.I.T.

We see a tendency in our scientific schools to cram students with facts, rather than to teach them how to solve problems by an ingenious application of knowledge.

This situation has been induced by the tremendous growth of technology and the attempt to telescope more and more knowledge in a four- or five-year technical course. This is no easy problem to solve. Regardless of the difficulty, somehow students must be given the realization that the objective of a scientific course is not merely a diploma, but rather to acquire the ability to apply knowledge gained in a useful and original manner.

With this in view, I began an experiment some years ago at my old school, M.I.T., setting up prizes for original design in the Mechanical Engineering Department.

The instructors found this so useful in stimulating ingenious solutions to problems that I set up a regular yearly cash award for "the most ingenious student" in the Department. The winner was selected by a commit-

tee on awards drawn from the Faculty which reviewed not only the student's scholastic record but his extra-curricular activities as well.

This stimulated the interest of the students in using their newly acquired knowledge in ingenious combinations, and the interest of the Faculty itself in uncovering talents in the students which were not apparent from routine classification. In any event, it has demonstrated the necessity for ingenuity as well as knowledge to those who would face the world as engineers.

The Incentive of Patents

The patent system was created to reward and stimulate ingenuity and inventiveness. Classifying a novel idea as the inventor's property which could be reserved for exclusive use or sold or leased for a royalty permits the idea to be used openly without fear of competition for 17 years and with due recourse to law if infringed.

These rights and benefits have produced a powerful incentive for people to exercise their ingenuity and devote their efforts to finding new, improved ways to do things and new tools with which to do them. There is no doubt that the existence of the patent and patent rights has had a profound influence on the rapid industrial growth of our country and served to bring native ingenuity to the fore.

In recent years, however, there has been a tendency on the part of the government to appropriate patent rights of individuals which will reduce and tend to kill the incentive they were originally designed to produce. History tells us that socialism, despite its well-meaning ideals, just doesn't work in the competitive world in which man has evolved. Man's natural tendency is to try to outdo his fellow man. If his efforts are not rewarded or are frustrated by rules, he will drift aimlessly.

For years, the National Inventors Council, of which I am a member, has sought with little success to have the U.S. government institute an adequate system of awards as an incentive to spur inventiveness and original work.

These awards would be in addition to and not a substitute for patents, as some have proposed. It makes no sense for the government to take patent rights because it has no means to exploit them and they thus become valueless.

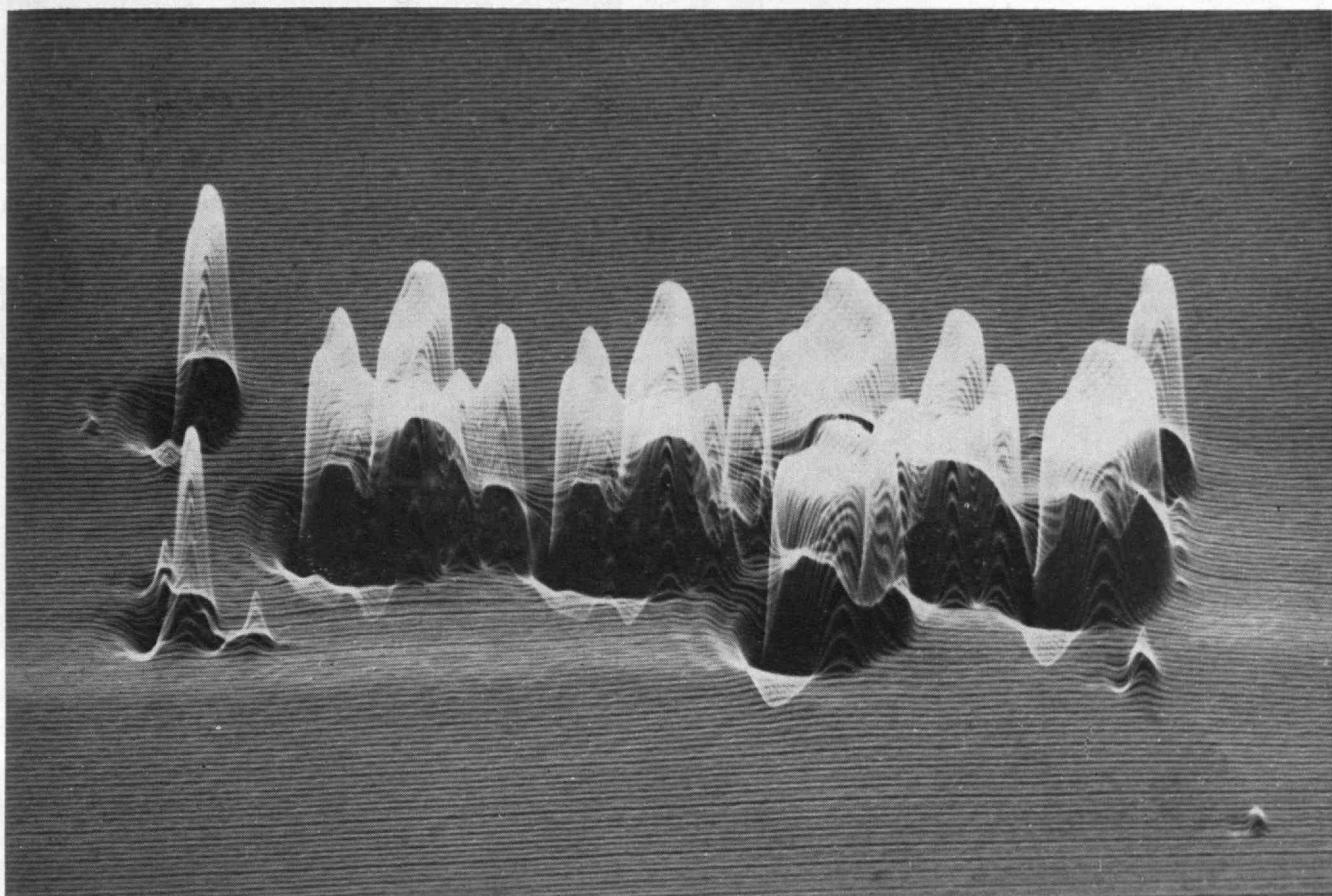
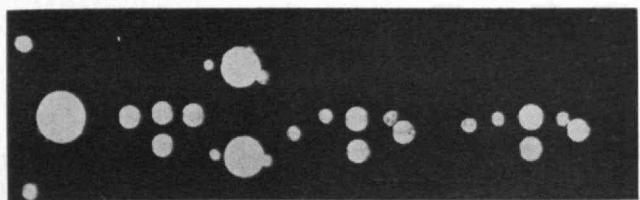
Ingenuity has been more than a major factor in man's evolution. It has been a key factor in his survival. The more enterprising members of the species that were man's ancestors began to arm themselves with stones and clubs against the stronger wild beasts. Thus, they used their own initiative rather than waiting for natural evolution to provide them with physiological means of protection.

In the world today we face a new and vital problem. Man has increased his physical power at a rate far greater than he has developed his wisdom to use it. The flint ax of the Stone Age has become a deadly thunderbolt with which man is capable of destroying himself and his world as well as his personal enemy.

What then lies ahead? None of us can tell. Certainly one thing we can do to gain a better fate than eventual extinction is to keep on solving individual problems.

There will always be a way if we have the ingenuity to uncover it and the wisdom to follow it.

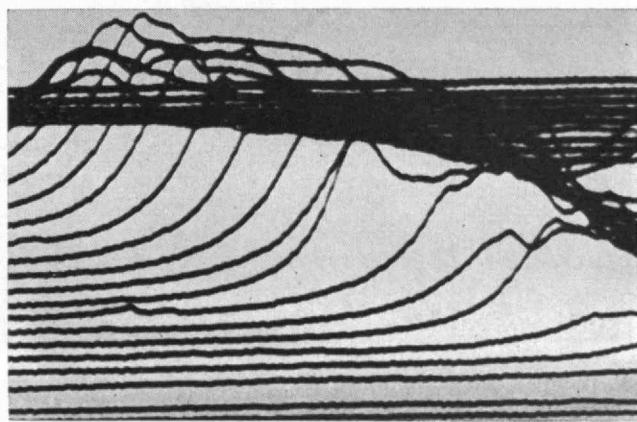
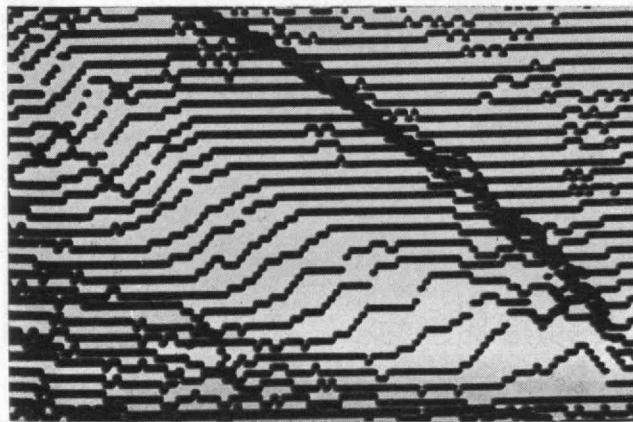
A Computer's Sketches On an Oscilloscope



How electronic data-processing equipment can be used as a visual design tool has been demonstrated at M.I.T. this term by Efraim Arazi, '63, a student of Associate Professor Robert O. Preusser. In addition to working on visual design projects, he has been employed at the Smithsonian Astrophysical Observatory. There he has been concerned with transmitting pictures of the stars to earth from a telescope in a satellite.

These pictures illustrate how he has produced unusual designs with a computer's help. They were made by feeding images from a TV camera to a computer,

sometimes directly and sometimes after they had been recorded on magnetic tape, and controlling the computer's representation of the data on an oscilloscope in various ways. The large picture above is of intensity domains produced by light penetrating holes in a black plate such as is shown above it. The two pictures below are representations of the Andromeda galaxy as seen by the Harvard observatory's 60-inch telescope. The one at the left was made by quantizing dimensional information identical with that used to produce the design at the right.



Folks From Home See What Goes On

PARENTS' WEEKEND brought 1400 visitors to M.I.T. in April from as far away as California. They heard talks by President Julius A. Stratton, '23, and others; marveled at demonstrations by Professors Harold E. Edgerton, '27, E. Lee Gamble, '30, and John Wulff; and trekked through laboratories with students as their guides. Music and diverting games were provided by computers. Many of the guests also visited dormitories, attended religious services in the chapel, and dropped in on the science fair then under way in the Rockwell Cage.



A sound wave generator in a freshman physics laboratory was one of the many pieces of apparatus shown to parents.



The day's planners included committeemen Michael Jablow, '62, Robert Blumberg, '64, and Bardwell Salmon, '62.



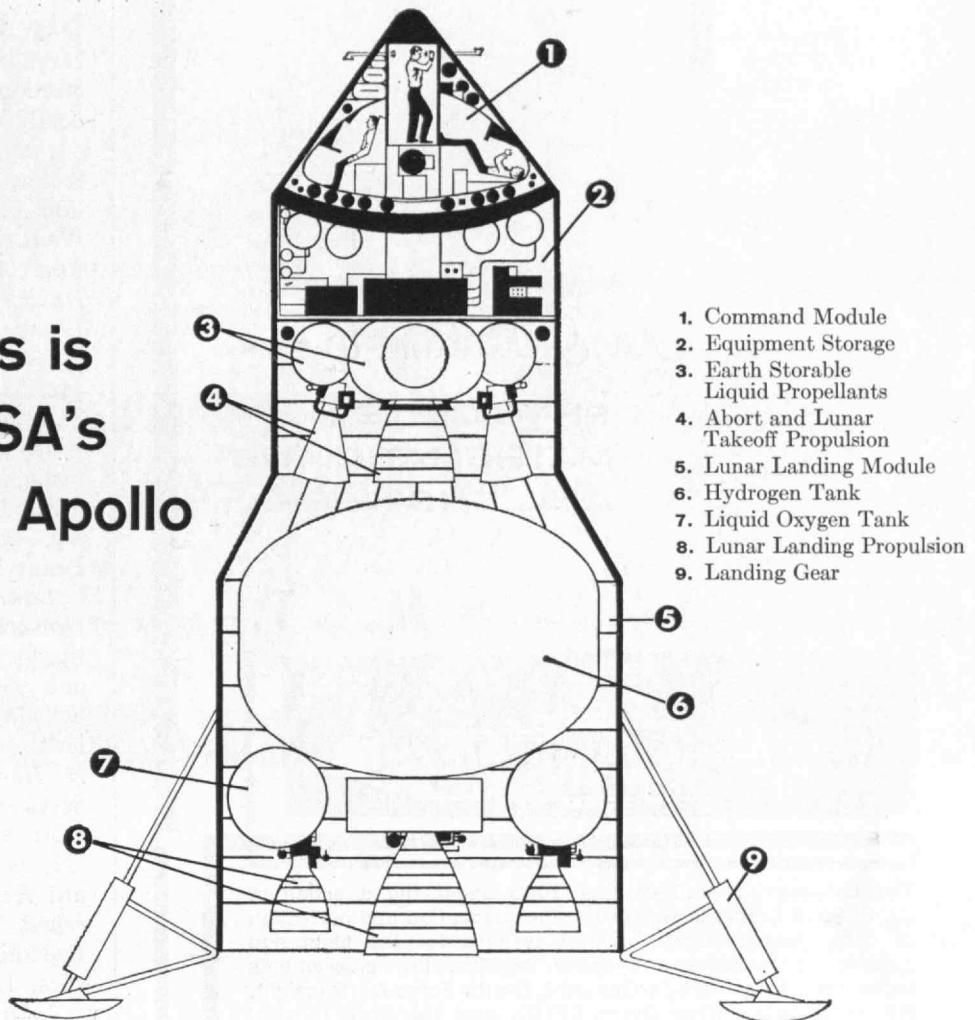
Parents heard All-Tech Sing finalists and spokesmen for the Faculty at Walker Memorial and Burton House banquets.



A radio receiver modified in an electrical engineering laboratory to show the signals at various stages fascinated

some of the visitors. Wave forms were shown on the oscilloscopes below the receiver, and explained by students.

This is NASA's Project Apollo



The men of NASA are readying for a journey that will surely be one of the most significant achievements of this century—Project Apollo, the landing of men on the moon and their safe return to earth. It will happen before this decade is over.

The project will proceed in three stages. Before the culminating voyages to the moon, three-man Apollo spacecraft will first orbit the earth for as long as two weeks. Next, spacecraft will head out toward the moon, circle it and return to earth.

The end product of Project Apollo and NASA's other space programs is not just placing a man on the moon, but the release of a flood of knowledge and benefits for mankind through research and development. We will chart the last unexplored sea on the map—the great void of space; we will improve weather forecasting (where even a 10 per cent gain in accuracy would save the nation billions of dollars every year); we have already taken the first steps in establishing a

global system of communications satellites; and we may expect new products and new techniques that will stimulate the entire industrial spectrum.

Still, the advances in scientific knowledge hold the exciting promise of much greater returns, far beyond what earthbound man can possibly envision.

SEND JUST ONE RESUME TO NASA

... it will be reproduced and distributed to all appropriate NASA facilities for consideration. You can be sure to play an important role in America's space achievements when you join NASA. Outstanding career opportunities are available in these locales: Washington, D. C. area; Mountain View and Edwards, Calif.; Hampton and Wallops Island, Va.; Cleveland, Ohio; Huntsville, Ala.; Cape Canaveral, Fla.; and Houston, Texas.

Write to: Director, Professional Staffing, Dept. 106, NASA Headquarters, Washington 25, D. C.

AN EQUAL OPPORTUNITY EMPLOYER. POSITIONS ARE FILLED IN ACCORDANCE WITH AERO-SPACE TECHNOLOGY ANNOUNCEMENT 252-B.



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

An Invitation to •••

**PHYSICISTS
MATHEMATICIANS
AND ENGINEERS**

from — **M. I. T.**



The Laboratory's staff of over 1000 under the direction of Dr. C. Stark Draper is engaged in the conception and perfection of completely automatic control systems for the flight and guidance of missiles and space vehicles. Its achievements include the Navy Mark 14 Gunsight, the Air Force A-1 Gunsight, Hermetic Integrating Gyros (HIG), and the Ship Inertial Navigation System (SINS). The Laboratory developed basic theory, components and systems for the Air Force THOR and, later, the TITAN missile. Other accomplishments include the Navy's POLARIS Guidance System.

Recently, the Instrumentation Laboratory was selected by NASA to develop the guidance navigation system for the moon space craft project, APOLLO.

Research and Development opportunities exist in:

- ANALYSIS OF SYSTEMS AND COMPONENTS
- HIGH PERFORMANCE SERVOMECHANISMS
- POWER SUPPLIES AND MAGNETIC AMPLIFIERS
- DIGITAL AND ANALOG COMPUTERS
- ELECTRO-MECHANICAL COMPONENTS
- TRANSISTOR CIRCUITRY AND PULSE CIRCUITRY
- RESEARCH, DESIGN AND EVALUATION OF GYROSCOPE INSTRUMENTS
- COMPUTER PROGRAMMING AND SIMULATOR STUDIES
- OPTICS, ASTRONAUTICS AND MANY OTHER AREAS

CALL OR WRITE HOWARD F. MILLER, PERSONNEL OFFICER

INSTRUMENTATION LABORATORY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
68 ALBANY STREET Bldg. 5 • CAMBRIDGE 39, MASS.
UNIVERSITY 4-6900, EXT. 3544

- Graduate courses may be taken while earning full pay.
"An equal opportunity employer"

Individuals Noteworthy

(Continued from page 10)

New Posts

NAMED in the news of promotions, elections, and appointments recently were:

Philip M. Dinkins, '18, as a Director, Geigy Chemical Corporation . . . *Benjamin H. Bristol*, '19, *Webster W. Frymoyer*, '21, *Rexford A. Bristol*, '26, and *Ralph Hayden, Jr.*, '33, respectively, as Board Chairman, Executive Vice-president, President, and Vice-president, The Foxboro Company . . . *James O. Crawford*, '26, and *William M. Davidson*, '26, respectively, as General Facilities Manager and as Vice-president, Engineering, Bell Telephone Company of Pennsylvania;

Lawrence C. Hamlin, '29, and *Howard E. Schwiebert*, '40, respectively, as Executive Vice-president and a Director, and as Operations Scheduling Manager, Mobil Petroleum Company Inc. . . . *Frank H. Hankins, Jr.*, '30, as Technical Services Manager, Lockheed Aircraft Service . . . *Willem Holst*, '32, as Vice-president, Esso Standard Eastern, Inc. . . . *John Lawrence*, '32, as Chairman and Chief Executive Officer, Dresser Industries, Inc.:

John T. Burwell, Jr., '34, as Vice-president for Research, American Radiator and Standard Sanitary Corporation . . . *Philip P. Johnston*, '35 as Vice-president, Planning, AMETEK, Inc. . . . *William S. Brewster*, '39, as board member, Liberty Mutual Insurance Company . . . *Frank E. Bothwell*, '40, as Chief Scientist, Center of Naval Analyses at Franklin Institute Laboratories;

J. Herbert Hollomon, '40, as Assistant Secretary of Commerce for Science and Technology . . . *Neil Burgess, Jr.*, '41, as Manager, Western Region, General Electric Defense Programs Operation . . . *Joseph H. Myers*, '41, as a Director, Emil J. Paidar Company . . . *Charles F. Peck, Jr.*, '41, as Director of Research and Development, Ceco Steel Products Corporation . . . *Joseph S. Quill*, '41, as Manager of Marketing, General Electric Receiving Tube Department;

John C. Sluder, '41, as a Director and Executive Committee member (Continued on page 42)



Was this the last word the last time you took a good look at your fire insurance?

Like **automobiles**, fire insurance policies come in improved models.

Once they were as simply put together as a Model T. They covered one peril — fire. But Manufacturers Mutual was not content to stop there. With its Associates, it has introduced a total of 19 insurance industry "firsts." All provide new benefits to policyholders. Practically none involve extra cost — a record unmatched by any other insurance company or group.

Also like **automobile models**, plant replacement costs change. How about the buildings, machinery, operating

equipment you secured ten years ago? They *might* be replaced today at double their original cost — if you could raise the money! Another good reason for taking a good look at your insurance protection. Make it enough for *today's* — not *yesterday's* — prices.

Expert help in evaluating your plant's fire insurance program is yours for the asking. Just write, wire, or phone the nearest Manufacturers Mutual District Office*. No obligation — except to yourself and your company's future.



1500 TURKS HEAD BLDG., PROVIDENCE 1, R. I.

Over \$81,000,000,000 Insurance in Force in the Factory Mutual Companies

Honey J. Freeman '16
PRESIDENT

Norris G. Abbott, Jr.	'21
Andrew T. Johnson	'21
Francis E. Slayter	'22
Maurice W. Williams	'22
Kenneth M. Warren	'35
Charles W. Freeman	'40
Roger M. Freeman, Jr.	'44
Colin A. Roberts	'46

Luxurious New Way to Enjoy City Living

CHARLES RIVER PARK

SPACIOUS TOWN HOUSES

Incomparable in Boston! The excitement of the city, the comfort of your own home. *Inside . . .* living and storage room to spare, a deluxe kitchen, individually-controlled air conditioning, privacy. *Outside . . .* trees, shaded paths, secluded lawns, gardens. Your address . . . *notable . . .* near business and cultural centers, smart shops, schools, houses of worship. At your disposal . . . every convenience from car rental to valet and maid service.



Choose the arrangement you prefer —

Duplex Town Houses, 3 bedrooms, 2½ baths . . .	from \$355
Garden Town Houses, 3 bedrooms, 2 baths . . .	from \$390
Harbor or River View, 2-bedroom, 2-bath apts. . .	from \$375
Other 2-bedroom, 2-bath apartments . . .	from \$270

Management and Leasing Under the Direction of



NILES

COMPANY, INC.

Offices in Charles River Park • LA 3-6103

**H. H. Hawkins
& Sons, Co.**

236 Washington Street

Newton, Mass.

Builders

IN THE WHITE MOUNTAINS

SPALDING

INN



**WHITEFIELD
NEW HAMPSHIRE**

A Family Tradition of Hospitality in a Magnificent Setting, 1300 Ft. Above Sea Level.

52 Rooms, Each With Private Bath and All Modern Appointments.

Attractive Cottage Suites.

Famous Food and Service.

Complete Social Program Including Summer Playhouse.

All Sports—Golf, Tennis, Fishing, Swimming, Shuffleboard & 18 Hole Putting Green.

Championship Lawn Bowling Green.

Perfect for Pre- and Post-Reunion House Parties, Graduation Trips and as Headquarters for Visiting Northern New England's Schools, Camps and Colleges.

OPEN MAY TO NOVEMBER

THE SPALDING FAMILY

Located at the TOP of
NEW ENGLAND'S
Fabulous HERITAGE TRAIL

Individuals Noteworthy

(Continued from page 40)

ber, The Nestlé Company, Inc. . . . James K. Littwitz, '42, as Administrative Assistant to the Manager, paper manufacturing organization, Eastman Kodak Company . . . Lynwood O. Eikrem, '48, as Manager of Product Development, David W. Mann Company;

Philip R. Vance, '50, and Alan J. Roberts, '51, respectively, as head of Tactical Systems Department, and as head of Strategic Systems Department, MITRE Corporation . . . Floyd L. Wideman, Jr., '50, as member of Management Board, Johnson & Johnson . . . Edward J. McCluskey, Jr., '52, as Director, Princeton University's Computer Center . . . George D. Prestwich, '52, as head of Systems Marketing Operation, General Electric . . . Richard T. Salter, '53, as Head, Fluid Mechanics Section, TAPCO, division of Thompson Ramo Woolridge, Inc. . . . John C. Herther, '55, as President, New England Section, American Rocket Society . . . Francois C. Vigier, '55, as Assistant Professor of Urban Design, Harvard University.

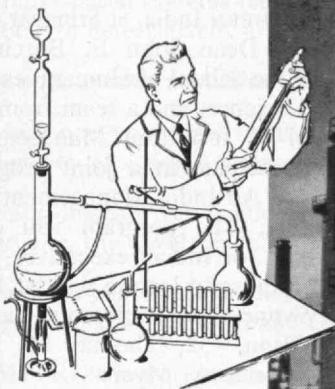
Honors to Alumni

RECIPIENTS of recent awards and similar distinctions have included:

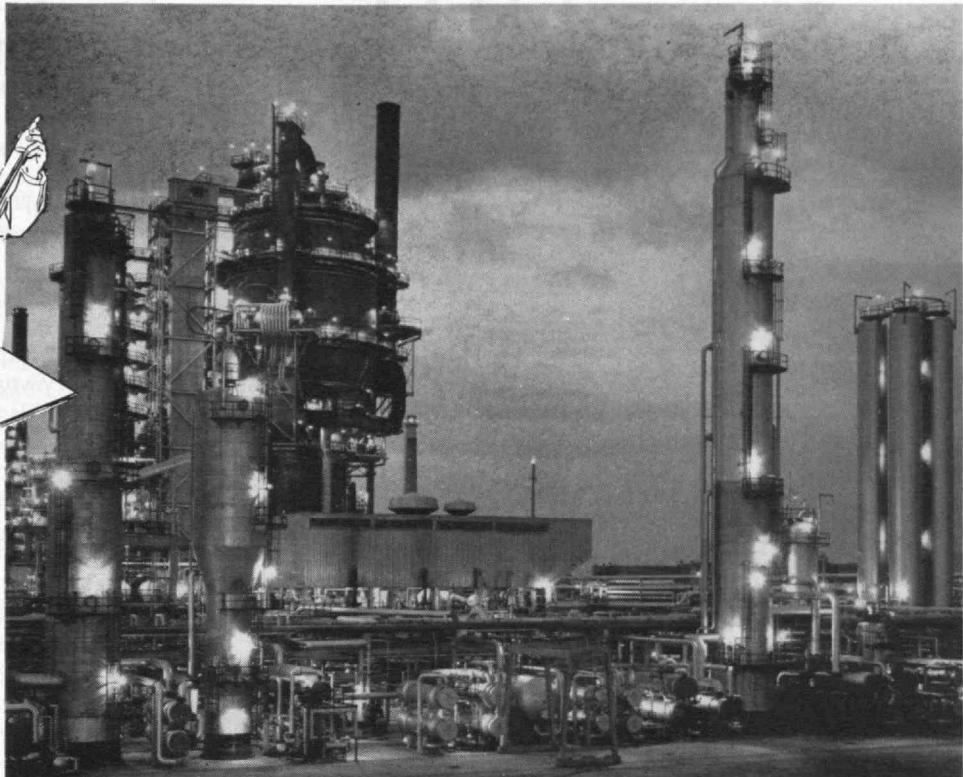
Otto E. Kirchner, Sr., '24, the Laura Taber Barbour Air Safety Award . . . Samuel B. Pritchard, '31, the Department of Commerce Meritorious Service Award (Silver Medal) . . . Montgomery B. Ferar, '32, the Industrial Arts Gold Medal . . . Richard Muther, '38, the Gilbreth Medal from the Society for the Advancement of Management;

Richard P. Feynman, '39 and Herbert Goldstein, '43, the Atomic Energy Commission's Ernest Orlando Lawrence Memorial Award . . . Colonel Thomas J. Hayes, 3d, '39, the George W. Goethals Medal . . . Jere L. Sanborn, '52, and Gregory Constantine, Jr., '54, Invention Awards from IBM . . . N. Edward Berg, '55, and William M. Wolf, '56, "Outstanding Young Men of the Year" awards by the Greater Boston Junior Chamber of Commerce . . . Lieutenant Colonel Francis W. Murray, '60, the Air Weather Service Merewether Award.

(Concluded on page 44)



Today's Swift
Technological Pace
Affects Insurance
Coverage Too!



YOUR Insurance Picture Can Change Overnight!

Among our clients are leaders in Chemical and Paper Manufacturing, Transportation, Electronics, Nuclear Physics, Atomic Energy and many others.

F & E knows from experience how quickly today's accelerated pace changes manufacturing processes, and creates new insurance exposures with respect to the protection of company property, products, employees, and business operations.

Keeping ahead of this constant change is a specialty at F & E. Whether up or down, we evaluate these changes in terms of flexible insurance programs which take into account these newly created situations and anticipate the future.

Let us help you streamline your insurance to fit today's fast changing requirements. You incur no obligation by a friendly, preliminary review with an F & E insurance specialist in your field.

Now is... ...the Time



Fairfield & Ellis
INSURANCE

60 CONGRESS STREET, BOSTON

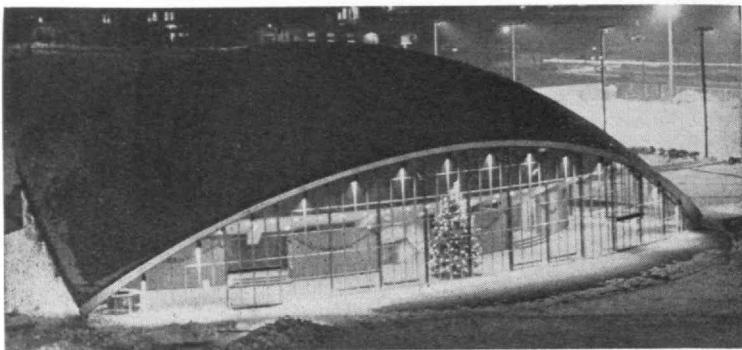
MONTREAL • NEW YORK • TORONTO

R. H. DAVIS, 1931

J. FAIRFIELD, 1931

F. T. TOWLE, 1908

Music at M.I.T.



Because of the many inquiries about the Centennial record album "Music at M.I.T.", now out of print, the M.I.T. Choral Society wishes to inform the M.I.T. Community of additional recordings by them which are now available for purchase.

Identifying Letter	Title	Records per set	Price per Set (postage—\$.50 extra)
A	"Fairy Queen"—Purcell	2	\$5.00
B	"B Minor Mass"—Bach with "Resurrection"—Büchtger and "Psalm 67"—Ives	3	\$8.00
C	"Saint Matthew Passion"—Bach	3	\$8.00
D	"Saint John Passion"—Bach	2	\$6.00
E	"Christmas Oratorio" (parts 2 to 5)—Bach with "Mass in C" (part 2)—Beethoven	2	\$5.00
F	"Theresa Mass"—Haydn	1	\$3.00
G	"Creation"—Haydn (Ready by April 1, 1962)	2	\$6.00

Veterans of two successful European tours, the M.I.T. Choral Society plans concerts this summer in London, Cambridge, Cologne, Paris, Berlin and Munich. Theirs is a repertoire of major choral works; American and European; contemporary, classical, romantic and baroque.

Please send me the records circled below:

A B C D E F G

I enclose \$..... for records plus \$.50 postage.

Name

Street

City Zone State

Please make checks payable to M.I.T. CHORAL SOCIETY and mail with above slip

KRESGE AUDITORIUM, ATTN: MR. RAY PARKS,
M.I.T., CAMBRIDGE, MASS.

Individuals Noteworthy
(Concluded from page 42)

Dean Burchard to India

IN NORTHERN India, at Srinagar, this summer Dean John E. Burchard, '23, of the School of Humanities and Social Science, and a team from the School of Industrial Management, will participate in a joint program with the All India Management Association. The program will offer seminars for Indian executives, and among those to lecture will be John M. Wynne, '56, Professors Carroll L. Wilson, '32, Thomas M. Hill, and Charles A. Myers.

En route to and from India, Dean Burchard will lecture in Lebanon, Iran, and Pakistan.

Alumni Officers' Conference

TO PLAN the Fourth Alumni Officers' Conference at M.I.T. next September 7 and 8, the following have been appointed to serve on a committee headed by Edward O. Vetter, '42: Jay Zeamer, Jr., '40, David P. Flood, '45, Frederick G. Lehmann, '51, Douglas F. G. Haven, '52, and James H. Eacker, '55.

Educational Leader

CARROLL V. NEWSOM, former president of New York University, has been elected president of Educational Services, Inc., in Watertown, Mass. This is the organization formed to continue the work of the Physical Science Study Committee at M.I.T. in modernizing secondary school instruction in physics.



ROGERS B. FINCH, '41, Chief of the Division of University Relations for the Peace Corps, addressed M.I.T. students this spring. Pictured with him is Daniel S. Spiers, Jr., '63.

A BROAD SPECTRUM OF OPPORTUNITY

MITRE works on the leading edge of a new technology — the creation of large computer-based systems (such as SAGE, NORAD, and BMEWS) that enable the military to detect attack and retaliate. Their purpose is to prevent war.

This work creates a wide range of career opportunities in many broad areas.

For instance, you might want to devote your talents to the full exploration of a single component in one system.

Perhaps, instead, you would prefer a more general assignment, such as the design of circuits, the development of radar, or the analysis of space hardware.

Or perhaps you would be more at home working on overall design of future command and control systems.

At MITRE the work ranges all the way from the detailed problems of electronic design to the abstract problems of national defense.

Whatever area you choose, you would find work that is important to your country.

... and work that is creatively challenging.

You would have the opportunity to grow, professionally, in an atmosphere of free and objective inquiry.

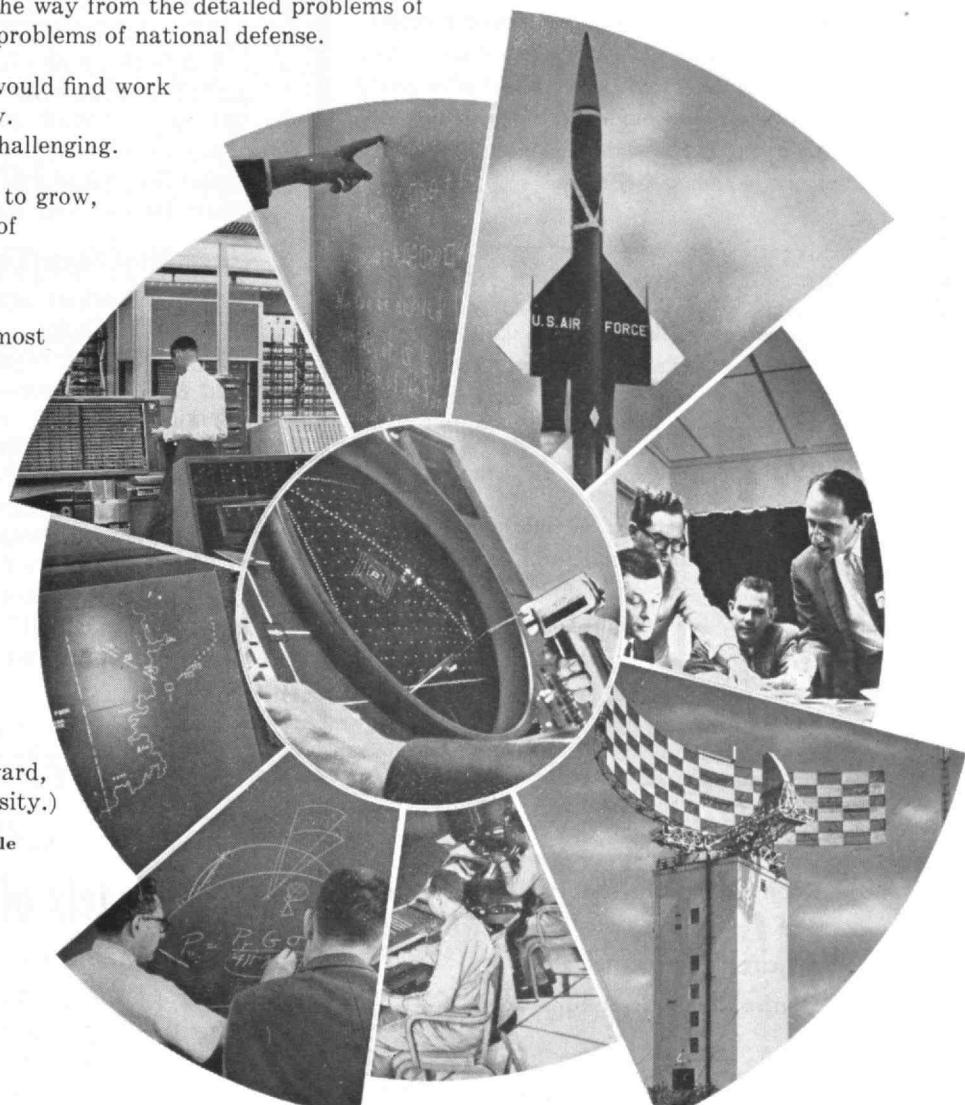
At MITRE you would become identified with projects of the utmost national urgency — projects that offer a real challenge to the talented scientist and engineer.

The rewards are great. Salary and benefit plans are competitive. MITRE offers excellent Educational Assistance and Staff Scholar programs that give every encouragement to employees who wish to continue their academic interests. (At the present time, MITRE employees are attending 15 different institutions, including MIT, Harvard, Northeastern, and Boston University.)

Currently assignments are available in the following broad areas:

- Data Processing Development
- Computer Application
- SAGE Design and Testing
- Operations Research
- Communications
- Human Factors
- Range Instrumentation
- System Cost Analysis
- Advanced System Design
- Econometrics
- Radar Systems and Techniques
- Air Traffic Control
- Space Surveillance
- Space Systems Command and Control
- Astrodynamics

MITRE is located in pleasant, suburban Boston. Openings are also available in Colorado Springs, Colorado; and Washington, D. C. Requirements are high — rewards are competitive. Minimum requirements, B.S., or M.S., or Ph.D. Write in confidence to Vice President — Technical Operations, The MITRE Corporation, Box 208, Dept. MTR 6, Bedford, Mass.



THE
MITRE
CORPORATION

An Equal Opportunity Employer

MITRE is an independent, nonprofit corporation working with — not in competition with — industry. Formed under the sponsorship of the Massachusetts Institute of Technology, MITRE serves as Technical Advisor to the Air Force Electronic Systems Division, and chartered to work for such other Government agencies as FAA.

MELPAR INC.

Qualified Senior Scientists who seek scope for growth are urged to consider these challenging openings at Melpar's fast growing **Applied Science Division** where achievement receives individual recognition.

Senior Scientists Communications Theory

Execute logical design and performance analysis of digital data communications systems, evolve practical implementations of coding techniques. Work closely with computer programmers on system simulation. Experience in digital design or background in coding theory desired.

Control Systems Design Theory

Perform research in the modern theory of optimum control and its applications. Investigate various methods of implementing optimum and sub-optimum control algorithms by digital and analog computers.

Requires good background in differential equations and analysis, appreciation of control problems, understanding of digital and analog computers, familiarity with current applicable literature.

For information, write or call:

Dr. Steven Sussman,
Head, Communications Theory Laboratory, or

Dr. Bernard Friedland,
Head, Control Systems Laboratory



A SUBSIDIARY OF WESTINGHOUSE AIR BRAKE COMPANY

APPLIED SCIENCE DIVISION
11 Galen Street, Watertown, Mass.
WAtertown 3-9700

An equal-opportunity employer

Books

(Concluded from page 34)

ment of the high-pressure engine to the design of a practical steam locomotive. Robert Stephenson (1803-1859), who had some formal education, was associated with many of his father's projects and applied a thoroughness and skill in administrative detail which was of the greatest importance to their success. During the years in which the network of railways was built in England, these two men were engaged in most of the major projects. Although George Stephenson has received a large measure of the credit, it should have been shared by both of them. During the latter part of his career, Robert Stephenson was engaged in numerous civil engineering projects, including the design and supervision of construction of tubular bridges, such as the Britannia Bridge at Menai Straits.

The author, who had engineering training, has succeeded in presenting technical descriptions in a clear and easy to read manner. *The Railway Revolution* brings to the reader the background of this important period in transportation history, and the vital part which George and Robert Stephenson played in it.

Have You Seen These Books?

NEW publications especially likely to interest Alumni of M.I.T. include:

High Magnetic Fields, the proceedings of a conference at M.I.T. sponsored by the Air Force Office of Scientific Research, edited by Henry H. Kolm, '50, Benjamin Lax, '49, Francis Bitter, and Robert G. Mills (The M.I.T. Press and John Wiley & Sons, \$15).

Principles of Electronic Instrumentation, by John G. Truxal, '47, and William A. Lynch of the Polytechnic Institute of Brooklyn (McGraw-Hill, \$7.50).

Signals and Systems in Electrical Engineering, by John G. Truxal, '47, and William A. Lynch of the Polytechnic Institute of Brooklyn (McGraw-Hill, \$12.50).

Announcing Abstracts of Theses 1959-1960

MASSACHUSETTS INSTITUTE OF
TECHNOLOGY

This new publication presents abstracts of 200 theses submitted in 16 fields for Ph.D. and Sc.D. degrees at M.I.T. during 1959-1960, with index of authors and supervisors; 256 pages.

Price: \$3.50 (postpaid on prepaid orders)

Similar volumes for 1953-1954 and 1958-1959 are also available @ \$3.50

Send orders to
OFFICE OF PUBLICATIONS, ROOM 3-333
Massachusetts Institute of Technology
Cambridge 39, Massachusetts

We have the facilities
to design — engineer —
develop and produce —

ANY IDEAS YOU MAY HAVE

involving *elastic* and
non-elastic fabrics,
cords and laces.

For military - civilian -
and industrial use.

**THOMAS TAYLOR
& SONS**

HUDSON, MASSACHUSETTS

ROBERT TAYLOR DAWES
Class of 1926

albert PIPE·VALVES & FITTINGS

STEEL . . . PLASTIC . . . ALUMINUM
STAINLESS . . . WROUGHT IRON

PIPE PILING & ACCESSORIES PIPE FABRICATION

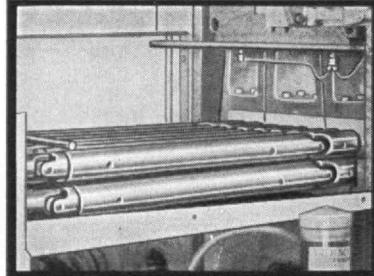
LIGHTWEIGHT SPEED-LAY® PIPE SYSTEM

S.G. ALBERT '29 • A.E. ALBERT '56

WRITE FOR FREE BROCHURE

ALBERT PIPE SUPPLY CO., INC.
101 VARICK AVE., BROOKLYN 37, N.Y.
TELEPHONE: HYACINTH 7-4900

How Curtis
solved a close
center-to-center
problem



The close center-to-center spacing of these drive spindles on a Sutton-Maust Precision Backed-up Roller Leveler created a tough problem for its manufacturer. He needed a universal joint strong enough to stand up under heavy rolling mill conditions, yet small enough to operate at such close quarters.

The answer was a Curtis universal joint! The maximum load carrying capacity and minimum torsional deflection of the Curtis joint was found to be completely satisfactory. And Curtis' famous Telltale Lock Ring construction permits quick disassembly for easier maintenance.

This is just one of the many power transmission problems solved by Curtis universal joints—size for size the strongest universal joints designed for industry. Selected materials, precision engineering, and 40 years' experience manufacturing universal joints exclusively make them that way.



WRITE FOR THE NEW CURTIS CATALOG, JUST PUBLISHED

14 sizes always in
stock $\frac{3}{8}$ " to 4" O.D.

Not sold through dis-
tributors. Write direct
for free engineering
data and price list.

TRADE
U
MARK
CURTIS
UNIVERSAL JOINT CO., INC.
86 Birnie Ave., Springfield, Mass.
As near to you as your telephone

Models Aid Tomorrow's Builders (Continued from page 30)

Faster and more economical ways of fabricating models are needed, and some progress in this direction already has been made by the Civil Engineering Department at M.I.T. in a program mainly supported by the National Science Foundation and the Ford Foundation. A method of rapidly producing a model of a shell-type structure, for example, has been developed at the Institute.

In this technique a model of the plastic, polyvinyl chloride, is molded in a vacuum press. The device used to prepare the mold for pressing permits one to form a surface of any geometry by raising plungers, which are located on a grid, to the necessary levels. Over the plungers is a rubber membrane, then a layer of sand, topped by a second rubber membrane. Removing air from the sand layer alters the molding characteristic of the sand, and refinements in the shape of the structure can be worked by hand with the air pressure reduced. Further reduction of the air pressure after the desired shape is achieved makes the sand very hard and stiff. A single plaster of Paris mold of the whole surface then may be cast for use in the vacuum press.

The model produced in this way may be loaded to simulate dead and live loads, and its structural behavior observed and measured. Loads are currently being applied either by hanging weights from discrete points on the model or by means of weight-lever systems. Efforts are now being made to simplify and make more universal loading systems to reduce the time needed for tests.

Impact on Education

A primary motive for the establishment of the models laboratory at M.I.T. is the potential impact of such techniques on the process of education. All great structural engineers have a feeling for, or intuition of, structural behavior. Too few of our practicing engineers have this characteristic, and it is one that can best be developed early in a student's work. The model technique will be a significant tool in the development of intuition for structural behavior.

Simple demonstration-type models which illustrate the behavior of various structural elements such as beams, columns, plates, or frames under working loads—and, to a lesser extent, the conditions for the mode of failure—have been developed at a number of engineering

(Concluded on page 50)

SOIL TESTING SERVICES, INC.

Consulting Soil and Foundation Engineers

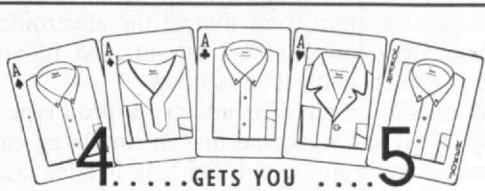
CLYDE N. BAKER, JR. '52

SYLVIO J. POLLCI '56

1827 North Harlem Avenue,

Chicago 35, Illinois

Bet on a Sure Thing...Draw 1 Free



DUNSTER SHIRTS

The buy of your life in oxford shirts!! The Coop has sold this shirt all over the world. It is accepted for its fine quality . . . quality of fabric, he-man styling and excellent tailoring. White or blue with button-down collar.

3.98

PAJAMAS DUNSTER

Dunster pajamas are cut and tailored for solid comfort. Made of a good quality broadcloth, they have the piped edges which add just a touch of smartness. Blue, gray or tan in coat or middy styles.

Sizes A-B-C-D 4.50
Long sizes B-C-D 5.00

Light Weight JAYSON Batiste Shirts

Fine quality imported cotton in a light weight batiste . . . white with short sleeves. Wash and wear. Choice of button-down collar style or medium spread collar with stays.

3.98



HARVARD COOPERATIVE SOCIETY
Harvard Square
Cambridge 38, Massachusetts

BUY 4-GET 5

A Free Shirt or Pajama

Buy 4 SHIRTS and/or pajamas at the regular prices quoted below and you get one shirt or pajama free. Buy as many lots of four as you wish. As your bonus, choose either the shirts or pajama described in this advertisement. Mix your order . . . any style . . . any color . . . shirts and/or pajamas. Dunster brands give you excellent quality . . . in fabric, fit and tailoring. Plan your shirt and pajama wardrobe now!! *Get your bonus!!*

Order Form

IMPORTANT . . . PLEASE NOTE . . . When ordering shirts give quantity, neck size, sleeve length and color. When ordering pajamas give quantity, style, size and color. Handling and shipping charges. New England states free, other states east of the Mississippi 35 cents per order, states west of the Mississippi 50 cents per order.

NAME _____

ADDRESS _____

Coop No. Check Charge

Those wishing to join The Coop for the fiscal year ending June 30, 1962 may do so by adding \$1 to their order. 1961-62 Patronage Refund rate is 8% on charge purchases and 10% on cash . . . payable October 13, 1962.

Models Aid Tomorrow's Builders

(Concluded from page 48)

schools. Most of these models, however, are for contrived conditions of geometry, stiffness, and loading. They are not models of structures the students themselves have conceived, such as can be produced by the new techniques.

Last year only about two dozen students were involved in model studies at the Institute, but the number participating this year is more than 100. As the ease of fabrication and testing is further increased, the model laboratory is likely to attract still more students. And as construction techniques continue to improve, increasingly complex structural arrangements will become feasible and the educational potentialities of structural models will be more widely appreciated.

One of the very few buildings in this country in which the model technique was used in design is the new Providence, R.I., Post Office. Its groined vault, thin-shell roof was designed by the consulting firm of Hansen, Holley and Biggs for the architect-engineer, Charles A. Maguire and Associates. The required shell thickness was found and the rib size and location to preclude buckling of the shell were determined by a series of model tests. This was done by a step-by-step process with models of 1/80 scale pressed from polyvinyl chloride.

An accurate model can serve as an extremely powerful tool in the development of theory of structural behavior. Studies of the buckling of a shell, for example, can serve to guide the formulation of basic equations describing its behavior.

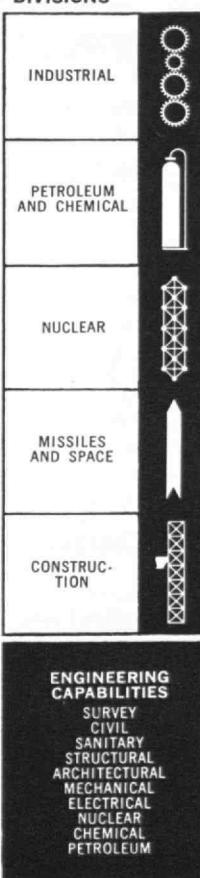
Frequently a model is the only means of verifying theory, because civil engineering structures are often "one of a kind," difficult to instrument, and extremely costly. The owner of a prototype is not likely to permit a load test to destruction, and it is unreasonable to expect him to do so. This places the civil engineer in a very different position from that of the electronic engineer who can breadboard his circuit, test it, and observe it before placing it in service.

In the missile or aircraft industry a prototype is extensively tested and observed first in simulated environments and later in an actual flight. It is adequately instrumented in each test. But the cost of such research is already tremendous, and as rockets increase in size the model technique may be required. Thus the very same techniques now useful in education, research, and the design of buildings may become essential to the improvement of space probes.

Reports to the Alumni Council

Ross H. SMITH, new Director of Athletics, and Professor Nevin S. Scrimshaw, Head of the Department of Nutrition, Food Science and Technology, addressed the M.I.T. Alumni Council's April meeting. Professor Smith endorsed the program of the late John A. Rockwell, '96, to develop "athletic students, not student athletes." Professor Scrimshaw emphasized nutrition's importance in mental and physical health and stature, and pointed out the need for a scientific rather than an empirical approach to food production and processing. President D. Reid Weedon, Jr., '41, presided.

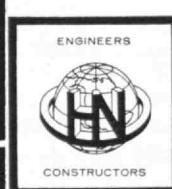
DIVISIONS



Announcing OUR ADVANCED TECHNOLOGY GROUP

ATG scientists and engineers bridge the gap between basic research and design concepts.

Their solutions can turn ideas into projects; "blue sky" into budgets. *Booklet on request.*

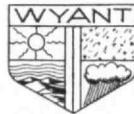


Holmes & Narver Inc.
828 SOUTH FIGUEROA STREET • LOS ANGELES 17, CALIF.

JAMES T. HOLMES, PRESIDENT—MIT '14

APPLIED TECHNOLOGY IS OUR BUSINESS

WE SERVE FROM SITE SELECTION, THROUGH PLANNING,
DESIGN AND CONSTRUCTION TO THE OPERATING FACILITY



Wyant

CONDITIONING CORPORATION

Air Conditioning Engineers + Contractors

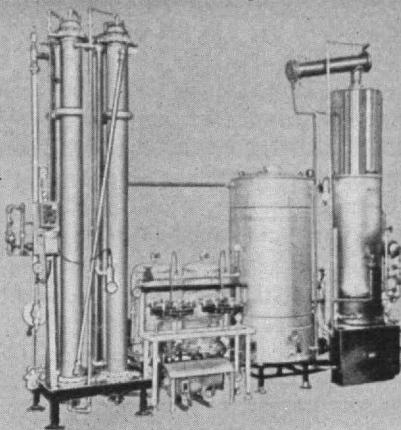
OXFORD 7-5798

505 FIFTH AVENUE • NEW YORK 17, N. Y.

Charles R. Kahn, Jr.; P. E., President, '37

BARNSTEAD

ENGINEERS PURE WATER
TO YOUR SPECIFICATIONS



PHILCO CORP'S Lansdale Tube Division uses this "Train" of Barnstead Pure Water equipment in various manufacturing cycles. Operating cost is low because the greater part of the process water is repurified and fed back into the system for re-use. This "Train" includes a Barnstead 20 GPH High Purity Still, 150 gallon, heated, ultra-violet equipped tank to prevent growth of bacteria, two BD-10 Holders with special high purity Supercarttridges®, an MF® 200 Submicron Filter, and Heat Exchanger. Another example of Barnstead's versatility in lowering manufacturing costs.

A. White, '26
T. Hartwell, '28
N. A. Everett, '48
V. C. Smith, '48
S. Beran, '58

Barnstead
STILL AND STERILIZER CO.
26 Lanesville Terrace, Boston 31, Mass.

BDC 1865 • BDC 1865

• BDC 1865 • BDC 1865 • BDC 1865



Boit, Dalton & Church

INSURANCE SINCE 1865

89 BROAD STREET, BOSTON 10 • Telephone HUBbard 2-3100

FREDERIC C. CHURCH

COLLINS GRAHAM

MAURICE B. ROTHROCK

HENRY SALTONSTALL HOWE

CHAS. COLBY HEWITT

COLBY HEWITT, JR.

ROBERT W. HARDING

DOUGLASS R. TEMPLE

FRANK W. HUMPHREY

ELLIS H. CARSON

PATRICK FITZPATRICK

BDC 1865 • BDC 1865

"What we require is a *landscape*, technically organized so that its parts work together, but visually coherent as well, and whose visual image is congruent with its life and action. This concept of landscape as a visual and functional whole is a relatively recent one in Western culture. Such a whole in nature is the mature stage of development, shaped by the consistent impact of well-balanced forces. In art it is the result of comprehensive purpose skillfully applied. The visual success of man-made landscape depends upon clarity and decisiveness of intent . . .

"In its essence, the sensuous experience of a site is a spatial one, a perception of the volume of air which surrounds the observer, appreciated principally but not entirely through the eyes. While this outdoor space, like architectural space, is made palpable by light and is defined by enclosure—overhead, alongside, and underfoot—yet it has peculiar characteristics of its own.

"The site plan uses different materials, notably earth, rock, water, and plants, and is subject to constant change, whether it be the rhythm of human activity and of the natural cycles, or the cumulative effects of growth, decay, and alteration. The light which gives it form shifts constantly with weather, hour, and season. Most important of all, it is seen, not as a single view, but in sequence over an extended period of time while the observer himself is in motion.

"This freedom to create illusion carries with it a responsibility to produce a clear and connected whole. A simple, readable, well-proportioned space in the outdoors is an event of great power." . . . from *Site Planning* by Kevin Lynch, author of *The Image of the City*. 1962, 256 pages, illustrated. \$7.50

Order from

THE M.I.T. PRESS

18 Vassar Street

Cambridge 39, Massachusetts

• BDC 1865 • BDC 1865 • BDC 1865

Institute Yesteryears

25 Years Ago . . .

ON JUNE 7, 1937, occurred the Institute's third Alumni Day which, like its two predecessors, took place under clear skies. The arrangements committee chairmanned by Percy R. Ziegler, '00, established a price of \$5 for a "blanket ticket" covering admission to all events.

In the morning a Housing Conference entitled "The Homes of Tomorrow" was presided over by Vannevar Bush, '16, and participated in by four speakers, including Sir Raymond Unwin of the British Ministry of Health.

¶ The next morning at Symphony Hall, commencement exercises marked the graduation of the Institute's 70th class.

The academic procession was led by Alexander Macomber, '07, who had been the 35th President of the Alumni Association in 1928-1929; and next came President Karl T. Compton and the commencement speaker, Gano Dunn, President of the J. G. White Engineering Corporation. At the head of the long procession of degree candidates marched *David S. McLellan*, President of the Class of 1937, and its three elected marshals: *George B. Wemple*, *G. Richard Young*, and *H. Arthur Zimmerman*.

50 Years Ago . . .

ON JUNE 4, 1912, at Huntington Hall of the Rogers Building on Boylston Street, Boston, the graduation of the Institute's 45th class took place. Of the total of 287 degrees awarded, 261 were bachelor's in the Class of 1912 and 26 went to candidates for advanced degrees, namely: six doctorates of philosophy and 20 master's of science.

In his address to the graduating class President Richard C. MacLaurin, on the day preceding his 42d birthday, said in part:

"We have entered upon the second half century of our history in very different circumstances from those in which the first was begun. I need scarcely say that this first academic year of the new era must long be a memorable one with Institute men. I congratulate the Class of 1912 on bearing a name—1912—that must mark a new epoch in the Institute's history: the year in which the new site was acquired—a site that made possible a great improvement in educational facilities and an adequate provision for social and athletic life such as had long been desired, but had never before been possible of attainment; the year, too, in which old friends and new came forward with gifts of unexampled munificence as tributes of appreciation of the good work that has been done by the old Technology and of faith in the even greater usefulness of the new. . . .

"You bear Technology's hall-mark, a signal honor that proves you have measured up to its standards while here. But a severer test awaits you. You must measure up to the standards that the world has set for the estimation of Technology men."

(Concluded on page 54)

STARTING A NEW BUSINESS?

Large or small—insure it with

BREWER & LORD

40 Broad Street

Boston, Massachusetts

NORMAN STOLZ XV '49

AUTHORITIES

on

Heating Air Conditioning Refrigeration
Commercial Kitchen and Supermarket Design
Plant Operation

Liberal fees paid for preparation of 800 to 1000 word articles on local spot-assignment basis. Complete instructions supplied for each article. Write giving field(s) of specialization to: E. S. COBB, Boston Publishing Co., Inc., Boston 16, Mass.

The TREDENNICK-BILLINGS CO.

Construction Managers

K. W. RICHARDS '07

H. D. BILLINGS '10

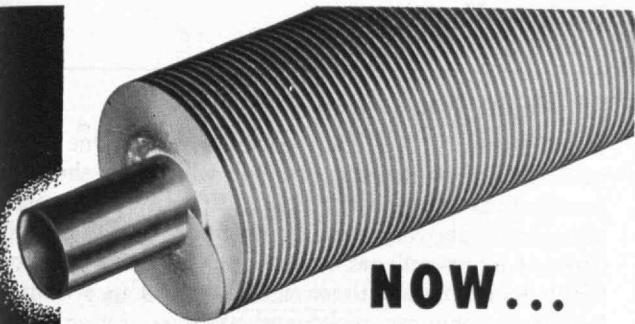
10 HIGH STREET

Building Construction

C. C. JONES '12

F. J. CONTI '34

BOSTON, MASSACHUSETTS



NOW...

Even More
Heat-Exchange Capacity

Even Less Air Friction

with **AEROFIN**
Smooth-Fin
Heating and Cooling Coils

Write for Bulletin S-55

AEROFIN CORPORATION
SYRACUSE N. Y.

GEARS
Designed and
Manufactured to meet
YOUR
Production Requirements

• Custom Gears Exclusively

DIEFENDORF
GEAR CORPORATION

SYRACUSE 1, N. Y.

DeBell & Richardson, Inc.

HAZARDVILLE, CONN.

Plastics Research and Development Laboratories

OFFERING INTEGRATED ENGINEERING SERVICE IN:

- Chemistry of High Polymers and Synthetic Resins
- Experimental Compounding
- Market Evaluation and Economic Studies
- Manufacturing Process Development
- Processing Equipment Design and Development
- Special Laboratory Equipment
- Product Design and Development
- Physical Testing and Evaluation
- Scale Models and Prototypes
- Embedments and Encapsulations
- Engineering Consultation
- Pilot Plant

JOHN M. DEBELL X A '17
HENRY M. RICHARDSON BS (EE)
U of Colorado '25
F. D. DEBELL X '44

S. B. KING V '47
R. S. DEBELL IX '48, XV '49
LeRoy A. White X '50

SYSKA & HENNESSY, INC.

Engineers

John F. Hennessy, '24

John F. Hennessy, Jr. '51



DESIGN • CONSULTATION • REPORTS
MECHANICAL • ELECTRICAL • SANITARY
VERTICAL AND HORIZONTAL TRANSPORTATION

New York City

PHILIP H. RHODES & ASSOCIATES

Consulting Chemists

Specializing in
Resins and polymers. Raw materials,
process and product development,
Application and Marketing.

2861 SIDNEY AVENUE CINCINNATI, OHIO

PHILIP H. RHODES '35

CHAUNCY HALL SCHOOL

Founded 1828. The School that specializes in the preparation of students for the Massachusetts Institute of Technology.

Roland A. Hueston, Jr., Principal, 533 Boylston St., Boston, Mass.

William H. Coburn & Co.

INVESTMENT COUNSEL

68 Devonshire Street
Boston 9, Mass.

HUMANICAL MACHINES

Objects, randomly located and oriented, are manipulated by thumb grasp, wrist twist, arm reach, waist turn, body lift coordinations, simply, precisely, powerfully.

WILLSEA WORKS

Rochester 5, New York

"Machine Builders Since 1840"

Institute Yesteryears

(Concluded from page 52)

75 Years Ago . . .

THE EDITOR of *The Tech* declared that, "One prominent feature of the Institute for which we should be greatly thankful, is the absence of many petty restrictions and annoying regulations under which the students of many colleges suffer. The only laws laid down for us to follow are those which control us within the buildings where we recite and work.

"No morning chapel or obligatory Sunday observances, no regulations about our conduct outside whatever, except that of course if anything was done to bring discredit upon the Tech, the student might be admonished. . . .

"We owe our freedom in a great respect, no doubt, to the absence of a dormitory system; though even if we had such a system, we have confidence enough in our Faculty to say that we do not think they would use their strengthened control in a tyrannical manner. . . .

"Restraint, even when judiciously applied, is obnoxious to young men of the present age, and in many awakens a rebellious feeling which leads a man against his own interests."

¶ As a parting shot, the last of his many *it-is-to-be-hoped's*, the editor of 1886-1887 called upon the Faculty to "furnish students of the Institute next year with a quiet reading-room. The room in Rogers, originally meant for this purpose, is now changed into a resort for Freshmen, where continual rows are taking place, and which is chiefly used as a lunch-room. . . . If any one goes in there to study, he is . . . lucky if his departure is not accelerated by his being hit by some article of food."

Management and Consulting Services

for
Industry — Large or Small
Research & Development Organizations
Investment Companies

Specializing In
Management Controls • Product and Long Range Planning • Organization
Audits • Integrated Material, Production and Cost Controls • New Product
Evaluations • Surveys
Jefferson 6-1031

LLOYD BERGESON '38
NOANK CONNECTICUT

CHAS. T. MAIN, INC.

Consulting Engineers Since 1893

HYDRO AND THERMAL POWER, generation and transmission
INDUSTRIAL PLANTS • PULP AND PAPER MILLS • TEXTILE MILLS
WATERFRONT DEVELOPMENTS • RESEARCH FACILITIES • NUCLEAR ENGINEERING
PROJECT INVESTIGATION • DESIGN • CONSTRUCTION MANAGEMENT

BOSTON, MASSACHUSETTS CHARLOTTE, NO. CAROLINA

PROFESSIONAL CARDS

JACKSON & MORELAND, INC.
JACKSON & MORELAND INTERNATIONAL, INC.
Engineers and Consultants

ELECTRICAL—MECHANICAL—STRUCTURAL
DESIGN AND SUPERVISION OF CONSTRUCTION
FOR
UTILITY, INDUSTRIAL AND ATOMIC PROJECT
SURVEYS—APPRAISALS—REPORTS
TECHNICAL PUBLICATIONS

BOSTON WASHINGTON NEW YORK

EADIE, FREUND & CAMPBELL
Consulting Engineers

500 FIFTH AVENUE NEW YORK 36, N. Y.
Mechanical—Electrical—Sanitary
Air Conditioning—Power—Process Layouts
James K. Campbell '11

METCALF & EDDY
Engineers

Soils, Foundations, Waterworks, Sewage Works,
Drainage, Irrigation, Flood Control, Refuse,
Industrial Wastes, Airports, Highways, Military
Projects, Industrial and Commercial Facilities.
STATLER BUILDING, BOSTON 16, MASSACHUSETTS

THE KULJIAN CORPORATION
Engineers • Consultants • Constructors

UTILITY • INDUSTRIAL • CHEMICAL
Power Plants (Steam, Hydro, Nuclear), Public
Works, Processing Plants, Oil Refineries, Tex-
tile Plants, Institutions, Highways, Expressways,
Airports & Facilities, Military Installations

H. A. KULJIAN '19 A. H. KULJIAN '48
1200 NO. BROAD ST., PHILADELPHIA 21, PA.

LOOMIS AND LOOMIS

consulting professional engineers

STRUCTURES FOUNDATIONS

WINDSOR CONNECTICUT

FABRIC RESEARCH LABORATORIES, INC.

*Research, Development, and Consultation
In the Fields of Fibrous, Organic, and Related Materials*
1000 Providence Highway Dedham, Mass.
(At Route 128 and U.S. 1 Interchange)

W. J. HAMBURGER, '21 K. R. FOX, '40 E. R. KASWELL, '39

LAUREN B. HITCHCOCK ASSOCIATES
Chemical Engineers

Industrial Research & Development
Technical & Economic Evaluations
Commercial Chemical Development—Air Pollution Control
Brochure on Request
LAUREN B. HITCHCOCK '20 Technical Advisor, JOHN H. SCHAEFER '26
60 EAST 42ND STREET NEW YORK 17, N. Y.

FAY, SPOFFORD & THORNDIKE, INC.
Engineers

Airports, Bridges, Express Highways
Water Supply, Sewerage and Drainage Systems
Port and Terminal Works
Industrial Plants Incinerators
Designs Investigations
Supervision of Construction

11 Beacon Street Boston, Massachusetts

CAPITOL ENGINEERING CORPORATION

Consulting Civil Engineers

DILLSBURG, PENNSYLVANIA, U.S.A.
ROBERT E. SMITH '41, President

MAURICE A. REIDY
Consulting Engineers

BRIDGES BUILDINGS
STRUCTURAL DESIGNS FOUNDATIONS
CONSTRUCTION CONSULTANT AND ARCHITECTURAL ENGINEER

Estimates and Appraisals

101 TREMONT STREET BOSTON, MASS.

CHARLES NELSON DEBES ASSOCIATES, INC.
Engineers and Architects

Structural, Electrical, Mechanical, Acoustical
Industrial, Commercial and Municipal Projects
915 EAST STATE ST. ROCKFORD, ILL.
C. N. DEBES '35

MORAN, PROCTOR, MUESER & RUTLEDGE
Consulting Engineers

Foundations for Buildings, Bridges and Dams;
Tunnels, Bulkheads, Marine Structures, Soil Studies and
Tests; Reports, Design and Supervision

WILLIAM H. MUESER '22 PHILIP C. RUTLEDGE '33
415 Madison Ave., New York 17, N. Y.

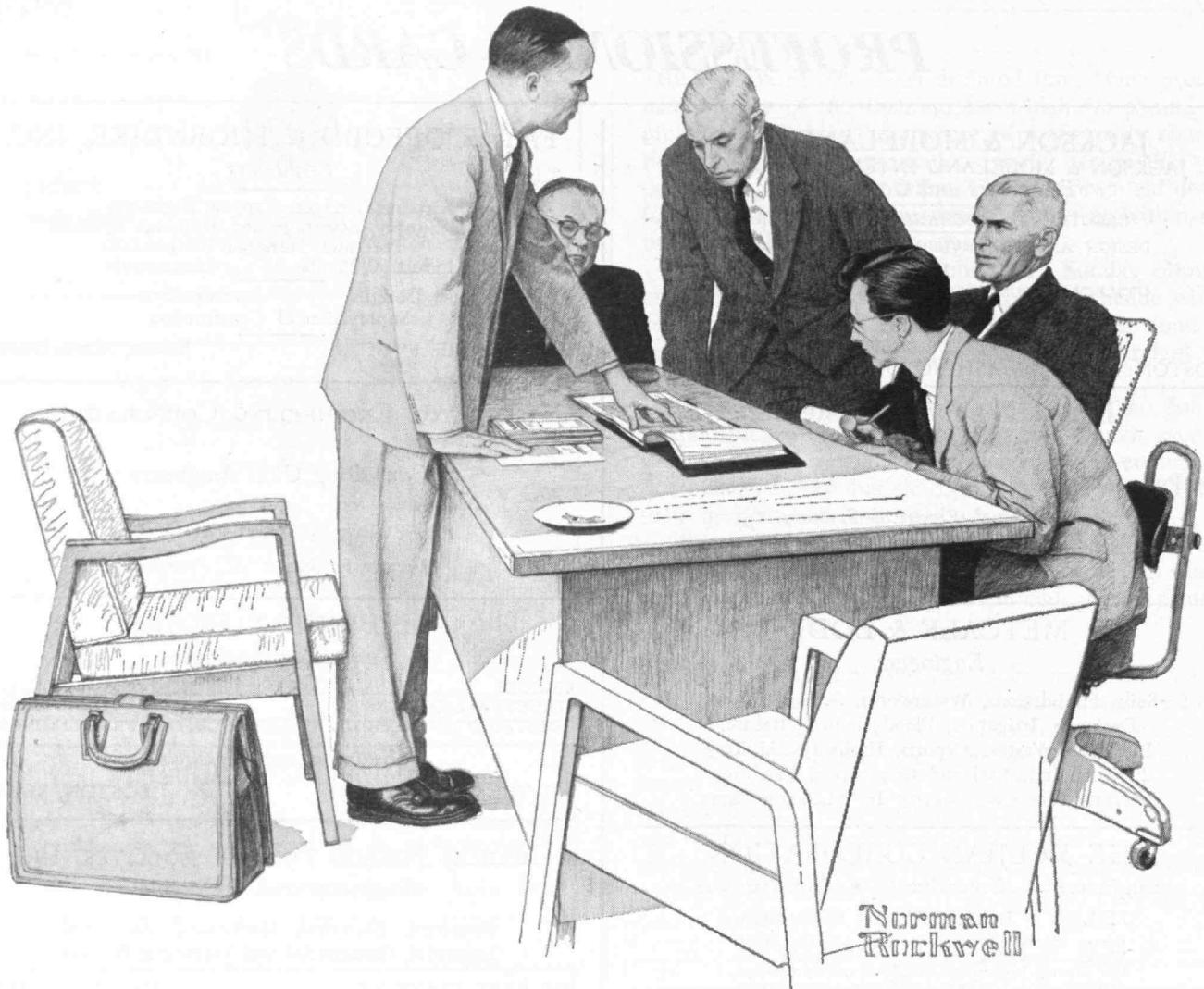
BREWER ENGINEERING LABORATORIES
Consulting Engineers

Electric Strain Gage Testing • Stress Analysis
Structural Model Testing • Structural Testing
Strain Gage Amplifiers • Strain Gage Switches
Ground Support Mechanism Design

MARION, MASS. TEL. 103
G. A. BREWER '38 J. D. INGHAM '43

CLEVERDON, VARNEY & PIKE
Consulting Engineers

HERBERT S. CLEVERDON '10 WALDO F. PIKE '15
JOHN A. DOW '23 HAROLD E. PROCTOR '17
Structural Designs Foundations
Heating, Ventilating, Electric and Plumbing De-
signs, Industrial Buildings, Reports, Investigations
120 TREMONT STREET BOSTON 8, MASS.



Norman Rockwell

A man's deep love for his family lies behind this meeting. He's planning his estate. Making sure that it will be a *maximum* estate with *minimum* transfer costs. For this job he has sought out the best advice obtainable...

Working with him are the trust officer of his bank, an attorney, an accountant — and the man from Massachusetts Mutual.

The man from Massachusetts Mutual is the kind of man to whom people turn for guidance... his business is planning financial security for in-

dividuals, for families, for business concerns. It's important, satisfying work.

And it's financially rewarding, too. In 1961, the average income of the men with our company five years or more was \$13,832 — and the top 100 averaged \$31,221.

Would you like to consider a career as a Massachusetts Mutual man? To combine independence with a stable income? And to earn while you learn? Take the first step now: Write for your free copy of "A Selling Career".

MASSACHUSETTS MUTUAL *Life Insurance Company*

SPRINGFIELD, MASSACHUSETTS · ORGANIZED 1851

Some of the Eastern Group Alumni in the Massachusetts Mutual Service:

M. I. T.

Lyman L. Tremaine, C.L.U., '23, New York
Harold Goodheim, '39, San Francisco
Harold G. Ingraham, Jr., '49, Home Office

LEHIGH

Russell E. Hoaster, C.L.U., '31, San Antonio
Edward Billstein, Jr., '40, Atlanta
R. Lester Dodson, Jr., '44, New York
William T. McInerney, '49, Cleveland

LAFAYETTE

David B. Adler, C.L.U., '17, Orlando
Frederic F. Lawall, '22, New York
David K. Aldrich, C.L.U., '38, Allentown
Frank W. Hiller, '43, Home Office
Richard A. Faust, '56, Binghamton
Aman M. Barber, Jr., '59, Allentown
Cameron D. Warner, '61, Bethlehem

Club News

Telephone Company Host to Indiana Club

On Tuesday evening, February 20, 45 members of the Indiana Association of M.I.T. were guests of the Indiana Bell Telephone Company at the headquarters building in Indianapolis. Mr. Eugene J. Popma, '58, the General Traffic Manager, was their host.

After a social hour and buffet dinner they met in the Dial Demonstration Room for interesting and informative talks given by Eugene Popma and Curt Jordan, a traffic engineer, on direct distance dialing and the use of area codes. A call was placed to Robert M. Kimball, '33, Secretary of the Institute, who talked to the group over the speaker phone about current activities at M.I.T. A drawing was held and the holder of the lucky number placed a free long distance call through the dial demonstration board. A film, "Answer for Linda," was shown, giving the group a picture of the operator as she accepts and completes calls.

A building tour to show the men more of the technical side of the telephone industry was conducted by traffic engineers who are well acquainted with the equipment behind the scenes. The women were conducted by telephone hostesses through the information and long distance operating rooms and some equipment areas. They were amazed at the number of operators required even with the dial mechanization. A question and answer session concluded the evening.—Eugene J. Popma, '58, Secretary, 4455 N. Emerson Ave., Indianapolis, Ind.

Californians' Speaker Discusses Population

Dr. Weldon B. Gibson, Executive Vice-president of Stanford Research Institute, enlightened a group of Northern California Alumni recently as to the perils of the population explosion. He indicated that the most serious problem was not the growth rate, but rather the acceleration of this growth rate. If the present acceleration continues, in a few hundred years there could be thousands of people per square yard of land surface—fortunately, the acceleration of the growth rate usually tapers off by natural means. Dr. Gibson also assured us that there is little substance to the theory that overpopulation causes war.

Among those attending the dinner meeting at the Engineers' Club in San Francisco were Mr. Gaynor H. Langsdorf, '32, head of the Bay Area Second Century Fund, and Mrs. Langsdorf. President H. Royce Greatwood, '24, and the other officers are now planning the next meeting for Palo Alto, which should take place in May.—Roger S. Borovoy, '56, Assistant Secretary, 635 Homer Avenue, Palo Alto, Calif.



FRIENDS OF MANY ALUMNI are outgoing chairman of the M.I.T. Silver Club, Anne Riley, and the president of the Quarter Century Club, Tom Chambers. Miss Riley now works for F. Leroy Foster, '25, and Mr. Chambers has been custodian at East Campus ever since he came to work for M.I.T. in 1924.

Long Island Club Elects Officers

The M.I.T. Alumni Club of Long Island has just completed one of its most successful seasons with two outstanding events.

The annual dinner meeting was held May 11 at the Huntington Town House. The featured speaker was Orhan Barim, Turkish engineer and Economic Affairs Officer at the United Nations, who discussed "Technology and Its Effects on Underdeveloped Nations." Event Chairmen Myron Cantor, '39, and Douglas Tooley, '28, hosted a large group of Long Island Alumni at this prime event and moderated the lively discussion following Orhan Barim's talk.

The club season ended on a lighter note on Saturday, May 26, when Warren Obes, '49, and Robert Franklin, '34, led the Long Island Alumni to West Point via the Hudson River Day Line.

Planning for its future, the Long Island Club elected its new officers at the May 11 meeting. Elected for the 1962-1963 season were: Chairman, Myron A. Cantor, '39; Vice-chairman, William Terry, '43; Secretary, Jimmie Chin, '56. Directors elected to the term ending in 1965 were Nelson Disco, '57, Julius Friedman, '27, John Sherman, '31, and Hugo Wikstrom, '50.

For information concerning Long Island Club plans for the coming season, interested Alumni should contact Myron A. Cantor, '39, 11 Sugar Tom's Road, East Norwich, L.I., N.Y.—Theodore W. Henning, '46, Secretary, 24 Madison Park Gardens, Port Washington, L.I., N.Y.

Washington, D.C., Alumni Plan Luncheon Meetings

The executive committee has nominated the following men as next year's officers: President, Sterling Ivison, Jr., '41; First Vice-president, William Howlett, '49; Second Vice-president, Gilbert H. Lewis, '51; Secretary, Paul M. Robinson, Jr., '44; and Treasurer, W. Seldon Saunders, '57.

Ladies Night, April 26, featured Dr. Florence W. Van Straten, atmospheric physicist, who spoke on "Weather Modifications." Dr. Van Straten was elected Woman of the Year in 1958 by the Aero Space Medical Association.

Plans are being made to organize a luncheon meeting for those Alumni working in Washington, D.C., similar to the group formed by those working at the Pentagon. Any interested Alumni should contact Gilbert H. Lewis for details.

John G. Barmby, '44, has reported on the activities of the M.I.T. Pentagon Luncheon Club, organized in late 1960. The club now meets regularly the third Monday of the month at 11:30 A.M. in the General and Flag Officers dining room of the Pentagon. Following lunch there is an informal talk by a guest speaker on newer research and development policies or defense organizational concepts. Walter G. Whitman, '17, Scientific Advisor to the Secretary of State, and Dr. Eugene Fubini, Deputy Director for Research in the Office of the Secretary of Defense have spoken to the club. All M.I.T. Alumni in the D.C. area are invited to the meetings.—Gilbert H. Lewis, '51, Secretary, 9914 Grayson Avenue, Silver Spring, Md.

Class Reunions Being Held This Month

Here's a list of classes holding reunions this month, the chairman, and the dates and places chosen.

1902: Reunion Chairman, Lewis E. Moore, P.O. Box 3138, Vero Beach, Fla.; Burton House, M.I.T. Campus, and University Club, Boston, June 8-10.

1907: Reunion Chairman, Philip B. Walker, 18 Summit St., Whitinsville, Mass.; Oyster Harbors Club, Osterville, Mass., June 8-10.

1908: Reunion Chairman, H. Leston Carter, 14 Roslyn Rd., Waban 68, Mass.; Melrose Inn, Harwichport, Mass., June 8-10.

1912: Reunion Chairman, James A. Cook, 8 Trinity Rd., Marblehead, Mass.; Snow Inn, Harwichport, Mass., June 8-10.

1915: Class Cocktail Party; Chairmen: Albert E. Sampson, 9 Thorndike St., Beverly, Mass.; and Barbara Thomas; Faculty Club, M.I.T. Campus, June 11, 4:00 p.m.

1916: Reunion Chairman, Ralph Fletcher, Box 71, West Chelmsford, Mass.; Chatham Bars Inn, Chatham, Mass., June 8-10.

1917: Reunion Chairman, Stanley C. Dunning, Apt. 22, 1572 Massachusetts Ave., Cambridge 38; Snow Inn, Harwichport, Mass., June 8-10.

1922: Reunion Chairman, Parke D. Appel, Old Farm Rd., P.O. Box 137, Dover, Mass.; New Ocean House,

Swampscott, Mass., June 7-10.

1927: Reunion Chairman, Glenn D. Jackson, Jr., Mack Hill Road, P.O. Box 83, Amherst, N.H.; Oyster Harbors Club, Osterville, Mass., June 8-10.

1932: Reunion Chairman, Thomas E. Sears, Jr., 31 St. James Ave., Boston 16, Mass.; Chatham Bars Inn, Chatham, Mass., June 8-10.

1937: Reunion Chairman, Philip H. Peters, 18 Cushing Rd., Wellesley Hills 81, Mass.; Everett Moore Baker House, M.I.T. Campus, June 9-11.

1942: Reunion Chairman, Alfred Goldis, 188 Arnold Rd., Newton Centre 59, Mass.; Mayflower Hotel, Manomet Point, Plymouth, Mass., June 8-10.

1947: Reunion Chairman, Parker Symmes, 18 Park Lane, Concord, Mass.; Griswold Hotel, Groton, Conn., June 8-10.

1952: Reunion Chairman, Sanford M. Isaacs, 50 Spruce Hill Rd., Weston 93, Mass.; The Yachtsman Hotel, Hyannis, Mass., June 9-10.

1957: Reunion Chairman, Gary Dischel, 1105 Lexington St., Bldg. 9, Apt. 1-4, Waltham 54, Mass.; Mayflower Hotel, Manomet Point, Plymouth, Mass., June 9-10.

Southern Californians

Publish Directory

The M.I.T. Club of Southern California has recently completed a directory of Alumni in the Southern California area, a project on which it has been working for the last six months. This directory will contain the names and addresses of the more than 2,000 Alumni in the area, as well as other information concerning the individuals. The committee, under the chairmanship of Richard J. Steele, '46, has worked diligently to assemble this directory, the first since 1958 when the project was started as a club endeavor by Hyram E. Beebe, '10. As the Southern California area continually gains in Alumni, it is the club's policy to mail a complimentary copy to a new arrival when notified of his change of address to this area. This enables him to feel as though he is part of the M.I.T. West Coast Alumni community.—Albert A. Livingston, '49, Secretary, 3850 Wilshire Boulevard, Suite 208, Los Angeles 5, Calif.; Arthur Schwartz, '47, Assistant Secretary, 8355 Blackburn Avenue, Los Angeles 48, Calif.

Deceased

RALPH R. LAWRENCE, '95, March 13*
MISS ELIZABETH P. HAMLEN, '96, Sept. 30*
CHARLES L. W. PETTEE, '97, April 1*
JAMES S. MCINTYRE, '98, June 21, 1961
ALFRED DEW. NUTTER, '01, March 8*
ASHTON C. PERSONS, '01, May 19, 1961
DENNIE K. KELLER, '04, Feb. 26*
PHILIP E. HINKLEY, '05, March 25*
WILLIAM G. HOUSKEEPER, '05, Mar. 23*
BEN E. LINDSLEY, '05, March 2
ROY F. LOVEJOY, '05, March 9
FRANCIS E. DANIELS, '07, April 5*
B. KARL SHARP, '07, March 8*
JOHN H. WALSH, '07, March 4*
DESAIX B. MYERS, '08, March 30
CARLETON D. JACOBS, '09, Feb. 22*
JOHN F. McCARTHY, '09, March 7
HAROLD N. CUMMINGS, '10, March 12*
VINCENT L. GALLAGHER, '12, March 24
ROBERT H. WOODS, JR., '12, Fall, 1961
CLIFFORD R. MACKENZIE, '14, Feb. 19*
HENRY DOWST, '15, Oct. 7
KENDALL P. FOSTER, '15, Nov. 7*
PARK D. MANBECK, '15, June 6, 1960*
OTTO E. STRAHLmann, '15, March 23
RALPH D. WATERMAN, '15, March 28*
LESLIE R. BARTLETT, '16, Jan. 2*

HAROLD E. SAUNDERS, '16, Nov. 11*
CARL A. BORLAND, '17, March 31*
LESLIE A. HOFFMAN, '17, Feb. 21*
THOMAS S. FOGARTY, '18, March 4
L. F. WOODRUFF, '18, Feb. 27*
WILLIAM M. MURPHY, '19, Oct. 21
LAWRENCE E. BOYDEN, '20, Feb. 6*
SIDNEY E. DUDLEY, '20, March 23*
H. SEYMOUR COLTON, '21, March 12*
ROBERT R. NEYLAND, JR., '21, March 21*
WALLACE K. SPOONER, '21, March 21
E. ELVIDGE TAYLOR, '22, March 4
JOHN K. CHRISTMAS, '23, March 9*
LYMAN M. DAWES, '23, March 6*
WARREN E. HILL, '24, April 2*
CHARLES K. LAWRENCE, '24, Feb. 21*
LEON G. RUCQUOI, '24, March 6*
JOSE A. ARENA, '25, March 31*
WILLIAM F. RICE, JR., '25, June 22, 1961*
PAUL V. JEWELL, '26, March*
HAROLD D. MORRILL, '28, Oct. 12*
ROBERT M. SNYDER, '31, Feb. 15*
WALTER L. GUZEWICZ, '32, Feb. 11*
RICHARD R. BROWN, '35, Oct. 30*
ELMER D. SZANTAY, '35, April 1*
HENRY S. SHARP, '39, Aug. 19
MISS ABBIE M. BUCK, '40, June 23, 1961*
GERARD L. HARTSTEIN, '51, March 2*
CHARLES G. VICKERS, '52, July 26, 1960
JAMES W. WOOD, '54, Feb. 28

Kish and Thorlin Speak in Detroit

On February 21, the M.I.T. Club of Detroit met at the Detroit Arsenal, the automotive center and focal point of conventional warfare for the Armed Forces. The host was Brigadier General John F. Thorlin, '48, the commanding general of the Ordnance Tank Automotive Command (OTAC). General Thorlin's master's thesis at M.I.T. on armor plate earned him election into Sigma Xi honorary research fraternity.

After dinner at the Officers' Club, General Thorlin described the activities of his command which has assumed added importance with the new emphasis on conventional warfare for limited engagements. OTAC is responsible for the design, procurement and logistic support of tanks, trucks, self-propelled artillery, jeeps, trailers, buses and armored personnel carriers for the Armed Forces and for ground equipment for Army missiles. The arsenal itself is located on 400 acres, north of Detroit, has 2.5 million square feet of covered area and employs 4,500 people. The 1962 budget is 1.3 billion dollars, used mostly for procurement, since only particularly unique design work is done in house. Logistic support is provided via repair parts, tools and manuals to 44 countries, and the command has one of the best automated provisioning systems available.

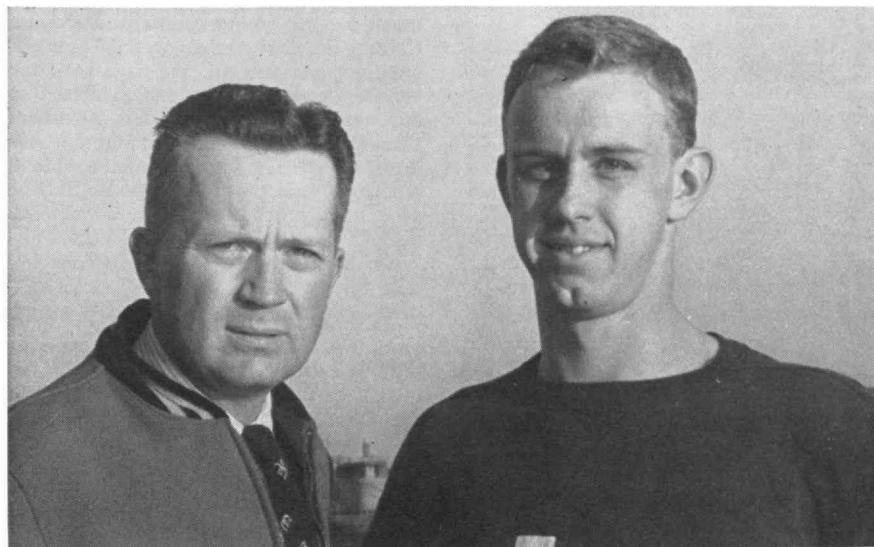
General Thorlin emphasized that contract awards are not necessarily made to low bidders but to bidders best qualified, based on technical ability and socio-economic factors. For those interested in getting government contracts, General Thorlin offered the following hints: try to obtain an R&D contract based on innovations of one's own company, read and understand the ground rules used in evaluating bids, and keep good cost data.

After General Thorlin's talk, the group visited the Land Locomotion, Power Plant and Climatic Laboratories. In the Climatic Laboratories, the temperatures range from -65 degrees to 125 degrees F to simulate conditions all over the globe.

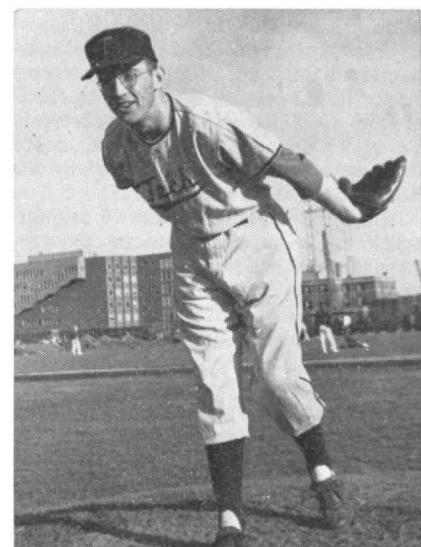
Some M.I.T. Alumni at the meeting were: Richard H. Abrams, '59, Peter Ashurkoff, '54, Henry C. Bagley, '39, Edward S. Coe, '33, Arthur E. Douyard, '42, Roy D. Haworth, Jr., '39, Ralph H. Larson, '60, Robert J. Meier, '41, James S. Moon, '26, Henry B. Moore, '44, William G. Peck, '40, Alden W. Peterson, '26, and George F. Tomlinson, '49.

A tour of the Hydrodynamics Laboratory of the University of Michigan on March 23 was conducted by Professor Couch of the School of Naval Architecture. He showed us the 400-foot towing tank for ship hulls, second largest of its type in the country, and the model shop and test instrumentation for full size ships as well as for models.

Detroit and Ann Arbor Alumni of M.I.T. and their wives then met for dinner at Webers' Supper Club. After dinner Charles S. Ricker, '42, introduced Professor George Kish who gave a fascinating talk about "Old Maps and Their Makers." Professor Kish is an authority on Russian geography and has been curator of maps at Clements Library of the



M.I.T.'S HEAVYWEIGHT CREW coached by Jack Frailey, '44, and captained by Chester Riley, '62 (above) started this year's season by winning 13 races in a row. Baseball players coached by Jack Barry (below) pinned their hopes largely on the pitching of George Haney, '62. Barry was named the New England Basketball Coach of the Year last winter after his team won 17, lost 4.



University of Michigan. He showed slides of maps from the days when Portugal was a major sea power and even today stone markers placed along the coast of Africa by the Portuguese are found where these early maps show the Portuguese flag planted. Few of these maps survived since they were considered top secret and were sunk to the bottom of the sea when a ship was in danger of being captured.

Some of those enjoying the talk were Eula and Henry C. Bagley, '39, William D. Bowman, '44, Grace and John J. M. Carey, '34, Iva and Everett F. Doten, '19, John C. Erickson, '55, Malcolm C. Johnson, '58, Everett V. Martin, '24, Barbara and William G. Peck, '40, Barbara and Frank G. Rising, '59, J. Edward Schwartz, '52, James M. Scofield, '41, and Snowden A. Williams, '57.—Ella Paton Gardner, '55, (Mrs. R. R. Gardner), Secretary, 1821 Villa, Birmingham, Mich.

Boston Stein Club Hears Two Speakers

On Tuesday, March 13, the Boston Stein Club heard Professor John T. Howard, '35, one of the foremost authorities on city and regional planning essential to our everyday living and future growth. Professor Howard discussed how homes, businesses, and tax dollars will be affected by city and regional planning of our future cities. He also mentioned the redevelopment of blighted areas, relocation of businesses, building codes, and other vital issues.

On May 3, the club was fortunate to hear Edward W. Brooke, Chairman, Boston Finance Commission. Mr. Brooke's commission has recently studied crime, corruption and conflict of interest in the community and how it affects the citizen.—John D. Shore, '12, Secretary, 14 Rendall Road, West Roxbury, Mass.

Class News

'91

In the February 16 issue of the Berkshire Eagle of Pittsfield, Mass., the following story of honors conferred on our own 1891 classmate, **Arthur W. Pierce**, appeared. "Arthur W. Pierce, 91, of 26 Thomson Place, oldest active member of the Berkshire Council, Boy Scouts of America, was honored yesterday noon by the Pittsfield Rotary Club at its luncheon meeting at the Wendell Hotel. Dr. Thomas M. Norton, Club President, presented Mr. Pierce a hand-lettered plaque bearing the inscription 'In appreciation . . . The members of the Rotary Club of Pittsfield express their thanks to Arthur W. Pierce for the many years of service to the youngsters of our city.'

"In his introduction, William D. Dyer, local scout executive, said that Mr. Pierce is undoubtedly the oldest active scoutmaster in the country today. He was, until the Coolidge Hill School recently closed its doors, the scoutmaster for a troop of crippled boys sponsored by the Rotary Club of Pittsfield.

"Uncle Arthur, as he is known to thousands of boys and men in scouting throughout the Berkshires, was born of missionary parents in Turkey in 1870. He is a graduate of M.I.T. and joined the General Electric Company in Pittsfield in 1904. He is past president of the G.E. Pensioners and is probably best known to Pittsfield residents as the gentleman who rides his bicycle no less than 10 miles every day weather allows. Besides being an ardent chess player, Mr. Pierce likes camping and working with rope.

"Mr. Pierce started his activities in adult Boy Scouting in 1921 and has been an assistant scoutmaster in Troops 6, 14 and 15, cubmaster of Pack 7 and scoutmaster of Troop 27, all of Pittsfield. He was given the Silver Beaver Award for outstanding work to boyhood by the Berkshire Council in 1946. Mr. Pierce could not stay for the entire Rotary meeting. He had a bowling date."

The following letter came with the clipping. "Dear Channing: You may be interested in the clipping I enclose. The plaque came as a surprise to me. From the wording of the dinner invitation, I thought I was to receive the 40-year veteran Scout badge. The 10-mile daily ride is a little out of date. Since my Christmas Day, 1957, stroke, I have had to cut it down to four miles. Cordially yours, Arthur W. Pierce."

It is perhaps unnecessary, indeed superfluous, to add that all members of M.I.T.'s Class of 1891 join with the members of the Rotary Club of Pittsfield in expressing their admiration and affection for this sturdy, patient, devoted man who has done so much and is still doing so

much for the young people of Berkshire County. So, dear Arthur, we send you our greeting, one and all. We say: keep the bicycle log up to date and exhibit it at our next meeting of the class.—**William Channing Brown**, Secretary, Summer Address, 36 Foster Street, Littleton, Mass.

'95

After gradually failing for the past year, our classmate, **Ralph R. Lawrence** died March 13 at his home in Belmont, Mass. As Ralph Restieaux Lawrence, he was born in Boston, February 28, 1873, the son of Charles H. and Isabel Restieaux Lawrence. He was graduated from the Boston English High School in 1891 and the M.I.T. Department of Electrical Engineering in 1895. He felt that his training at M.I.T. made it possible for him to go into teaching as a profession. He was a special student at M.I.T. in physics and chemistry in 1895 and after a year with the Westinghouse Electric and Manufacturing Company, he was appointed an assistant at M.I.T. in 1896. He became an instructor in 1898, assistant professor in 1905, associate professor in 1917, and full professor in 1922, which position he held until his retirement in 1941.

He was in charge of the teaching of alternating currents and alternating-current machinery. After spending some time with the General Electric Company, he wrote "Principles of Alternating Current Machinery," which was published in 1916 with two subsequent editions. It has been very widely used in this country and abroad and had a great influence in electrical engineering instruction throughout the United States; it was even translated into Japanese. Later, this book was followed by his "Standard Handbook for Electrical Engineers," a work on storage batteries.

He was active in the evening instruction of the Lowell Institute School; a fellow of the American Institute of Electrical Engineers; member, the American Academy of Arts and Sciences, Boston University Club, Appalachian Mountain Club and the Technology Club. Following his retirement in 1941, he was recalled to the Institute on a part-time basis during the war years; at that time he assisted instruction in the Electrical Machinery Laboratory. . . . In 1922, he was married to Miss Reba Bush, who is his only survivor; she lives at their home at 66 Stone Road, Belmont, Mass.

Our class constitution calls for an annual meeting in June at the time of M.I.T.'s graduation. This meeting is generally held in the Great Court after the luncheon. We hope you will attend.—**Andrew D. Fuller**, Assistant Secretary, 120 Tremont Street, Boston 8, Mass.

'96

The annual meeting of the class will be held at the luncheon table on Alumni Day, June 11. There is nothing on the

agenda; members may forward to the secretary any nominations for class officers. . . . There was a notice in the April Review that **Walter H. James**, now of 17 Boxford Road, Topsfield, Mass., was appointed assistant professor of mechanical drawing at M.I.T. 50 years ago. At the same time, Henry K. Burrison, '75, was appointed assistant professor of mechanical drawing and descriptive geometry. Did anyone ever try to use "descrip"? A draftsman at a Navy Yard who was required to locate a guy through a maze of chimneys managed to recall his almost forgotten "descrip." . . . Walter James continues his license to drive but long trips are not tried—just occasional local ones about town. His hobby is cabinet work and chairs; his shop was burned down a year ago but has since been restored so that he still enjoys working in it. Friends and neighbors are so solicitous of Walter's happiness that they overwhelm him with orders. His son lives in Florida, but his daughter and her family live nearby and keep careful watch over his welfare. . . . **Elizabeth Perkins Hamlen**, who was with us about two years and was a secretary in Boston, died September 30, 1961. At the Alumni Council meetings Joseph Harrington, Jr. and his son, '61, frequently visit with your '96 secretary. It is very pleasant to have a son and grandson of our **Joe Harrington** extend their greetings to the class. Some of our '96 grandfathers might show interest by dropping an occasional note.—**James M. Driscoll**, Secretary, 129 Walnut Street, Brookline, Mass.; **Henry R. Hedge**, Assistant Secretary, 105 Rockwood Street, Brookline, Mass.

'97

Our class has been very unfortunate in the last few months in losing four members—Pratt, Ilsey, Sargent and Pettee. Three of them were active in class affairs. An obituary notice of Pettee follows. Similar notices from relatives of others lost will be appreciated, and I will attempt to publish them from time to time.

"**Charles L. W. Pettee**, recently a resident of Brush Island, Darien, Conn., and for many years a businessman and resident of Hartford, died Sunday, April 1, 1962, in Stamford, after a brief illness. He was born in Tiffin, Ohio, on December 4, 1874, the son of Captain Lemuel Pettee and Mary Westall Pettee. Later he attended schools in Newton, Mass., and was graduated from the Massachusetts Institute of Technology in 1897. After working for various companies in Hartford, he opened his own laboratory, known as the Laboratory of Charles L. W. Pettee, providing chemical analyses and related services to industries throughout the northeastern states. He retired in 1950. During World War I, he presented to the United States government an original formula that he had developed for the analysis of platinum.

"In 1900 he married Edith Sawyer of Hartford, who died in September of 1960. He is survived by three children: Mrs. Robert Conklin of Reeders, Pa.; George

S. Pettee of Bethesda, Md.; and Charles E. Pettee of Darien, Conn.; and five grandchildren. Mr. Pettee was a member of the American Association for the Advancement of Science and of the American Chemical Society. He also had been active in the Connecticut Pomological Society, the Connecticut Beekeepers Association and the Connecticut Forestry Association."

On the more cheerful side, brief answers to my circular letter of February 23 have been received from some 10 members, a nearly 50 per cent return. Not one volunteered for secretary-treasurer, only one or two made suggestions for that office, and only one expects to be in Cambridge June 11. So, in order that M.I.T. should know that not all graduates are decrepit after 65 years, the writer is assuming that it is the class agent's duty to carry on until the volunteer secretary-treasurer appears.—**George R. Wadleigh**, Class Agent, 70 Flower Avenue, Hastings-on-Hudson, N.Y.

'98

We quote from '98 Class Letter, Number 27, April, 1962, which was mailed from Chicago on April 6, 1962, by our forehand President, **Daniel W. Edgerly**: "The enclosed about the 65th gives us an opportunity to hear from you. This would indicate to the officers of the class, how many still have an interest in '98. Your M.I.T. Class is probably your fundamental remembrance and tie with the alma mater. We are all proud of the growth of the Institute and its wonderful development, both in buildings and curriculum. With our 65th, we will have to consider the procedure for the following years." . . . Enclosed with this class letter was another letter, entitled: "Class of '98, 65th Reunion, June, 1963," from which we quote in part: "A trip back to alma mater will be most interesting. We have a problem as to a decision on a one or two-day program. It is up to you to decide." Then follows a brief description of a possible two-day program and the following, which we quote in full: "We would like an indication of your being with us, even if this is a year prior to the reunion date. It will give us some data as to arranging the final schedule, which will be mailed to you in the spring of 1963."

Presumably, before reading the Class News, you have read Dan's letters and have supplied the information requested and mailed this information in the enclosed return stamped envelope. We also suggest that as many as can arrange to attend Alumni Day, June 11, 1962, in the course of which we can hold a brief class meeting, and with the data furnished the president, map out the reunion to be held the next year; i.e., in June, 1963. Forehand? Of course. Why not? Adopt the old '98 yell—"98, this way!" The officers of the class are looking forward with great interest to the information that will be furnished by this brief questionnaire sent out by President Edgerly. In the meanwhile here follow-

Happy Birthday

The M.I.T. Alumni Association Honor Roll now includes one centenarian, 94 nonagenarians, and 788 octogenarians. Best wishes are extended to the two Alumni celebrating their 85th birthdays this month, and to the ten Alumni who will turn 80 in June. They are listed below with dates of birth:

June, 1877—**ERRETT M. GRAHAM**, '05, on the 8th; and **HERBERT R. STEARNS**, '00, on the 17th.

June, 1882—**CARLETON E. ATWOOD**, '05, and **JOHN N. BOYCE**, '09, on the 3rd; **JOHN F. ALTER**, '11, on the 4th; **WILLIAM G. ABBOTT, JR.**, '06, on the 8th; **ERNEST A. MINER**, '07, on the 11th; **WALTER P. REGESTEIN**, '03, and **FREEMAN M. SCALES**, '06, on the 20th; **HENRY B. THOMSON**, '06, on the 24th; and **FREDERICK W. FARRELL**, '04, and **JAMES R. STEVENSON**, '10, on the 28th.

eth news concerning active classmates.

Our most energetic Assistant Secretary, **Frederic A. Jones**, has to work off some of his energy by writing a series of articles for the Needham Times. The compiling of these articles requires considerable searching of deeds and other antiquarian documents. Note the titles of the articles. Needham Times, November 23, 1961: "Red Cross Secretary Occupies House Once Home Of First Minister's Son." Needham Times, February 1, 1962: "Great Plain Avenue Home Was Tea Tavern." These articles, each covering three full columns in the Needham Times, are written with Fred's usual charm. We will quote a few sentences from each article to give readers an idea of the subjects covered. "November 23, 1961. The story of this house begins with Samuel Townsend, the second son of three sons and four daughters of the Reverend Jonathan Townsend, Needham's first ordained minister. Samuel owned a tract of 55 acres in the southeasterly part of the town. In a deed of 1790, he called it, 'his farm on the southerly side in the first parish in Needham,'" etc., with most meticulous enumeration of transfers of property, marriages, births, ending with the comment, "So, the story of an old Needham tavern and stage coach route was a good one while it lasted."

February 1, 1962: "This article will tell a little about this quaint Cape house in the westerly part of the town at now 1746 Great Plain Avenue, corner of Mayflower Road, and of its early history and occupants. The story starts with Colonel William McIntosh, a very prominent man of Needham in the old days. Born and brought up in Dedham, he was left fatherless at the age of two. In 1736, at the age of 14, he moved to Roxbury, where in 1745 he was married to Abigail Whiting. He was active in the French and Indian War, particularly in the vicinity of Lake Champlain and Lake George. He returned to Roxbury after the war. In 1764 at the age of 42, he moved to Needham, which was to be his home for 49 years, until his death in 1813 at the age of 91." And then follows an interesting and scrupulously exact story of dividing

lots, building houses, deeds, and conveyancing, etc., until we come to the following: "In 1951, Campbell conveyed this Lot 1A to Charles S. and Marguerite B. Stoddard, who about nine years later in 1960, conveyed to T. Douglas and Shirley L. Stenberg, the present occupant and owner." There is also a very fine picture of the houses on the property, taken by Fred. Thanks, Fred, for these interesting articles, for the search and efforts which went in to their preparation, and for the example of energy and activity to your classmates.

Fred has kindly loaned us for these notes a write-up concerning a recent family party; and it will be noted that five of Fred's family in this party celebrated their birthdays, which occurred in the early part of February. The write-up by the press follows: "Townsman, February 15, 1962. Jones Family Party At The Pillar House—Four generations attended the annual birthday party held at the Pillar House, Newton Lower Falls, on February 10 for five celebrating members of the Joneses, including one family from Wellesley. Among those present were Mr. and Mrs. Robert L. Jones of 35 Beverly Road, and their two children, Kimberley, 6, and Pamela, 3, Mr. and Mrs. Harold Jones of Springfield, the parents of Robert Jones; his grandparents, Mr. and Mrs. Frederic Jones of Brighton; his uncle, Leslie Jones of Newport, R.I.; William Blaine, son of Mrs. Frederic Jones, with his wife and three children, Barbara, 15, Beverly, 13, and Billy, 11, all of Brighton. The five Februarians were Robert Jones' wife, Sevance, his mother, Audrey, his grandfather, Frederic, together with Beverly and Billy Blaine." Those who have attended M.I.T. Alumni Day Celebrations will readily recall the Assistant Secretary of the Class, Frederic A. Jones, his daughter Audrey, and his grandson Robert L. Jones.

Our distinguished classmate, **Roger W. Babson**, now owns and operates so many businesses, institutions and organizations that it is almost impossible to look over any newspaper without finding an article or two or more about the "Boss" or some one or more of his properties. Early this year, a series of meetings was held at Babson Park, Wellesley Hills, Mass., in which the principal speaker was U.S. Secretary of Commerce Luther Hodges, whose remarks were quoted quite fully by the Boston and national press. Again, recently, in the Boston Sunday Herald of April 8, 1962, the rotogravure section, there was a picture of Dr. Henry A. Kridel, President of Babson Institute, chatting with Senator Leverett Saltonstall. . . . **Fred B. Dawes** still goes to his office in Hudson, Mass., quite regularly. Fred has always been very faithful in attendance on the meetings at M.I.T., the reunions of the Class of '98 and the meetings of the M.I.T. Club of Worcester. Probably members of the class recognized Fred's picture in Newsletter Number 8. Under this picture, taken with three others (and a very fine picture of Fred at that), was the following legend: "Worcester: Four men with reason to be proud, for theirs was the first S.C.F. area in the nation to exceed 100 per cent of its quota: (left to right) Haskell R. Gor-

don, '38; Fred B. Dawes, '98; Thomas H. West, '22, S.C.F. Area Chairman; and Robert T. Dawes, '26." Robert T. Dawes, by the way, is Fred's son, who is his successor in running the Dawes properties, and has been very prominent in past years in the M.I.T. Club of Worcester, and in class agent circles at M.I.T.

Our classmate **Carl S. High**, of Partridge, Kansas, after completing Course VI in 1898, returned to Kansas, and carried on an increasingly large farm and cattle ranch business (which he described some years ago in the course of a trip to the East). Carl has always been faithful to M.I.T. and '98, and has attended all the usual get-togethers and reunions of the class. When his farm at Partridge, Kansas, got too large to handle, he turned it over to his son and retired to Sarasota, Fla. But the old urge was too strong for him, so he presently took over land at Sarasota and started ranching again. About two years ago, after Alumni Day at M.I.T., he visited my sister and myself at our home in Marblehead. At that time, he remarked that taxes were so high in Sarasota, he did not know how long he could afford to operate. We have just received a notice from the Alumni Association office that Carl has returned to Partridge, Kansas. We are looking forward to seeing him, as usual, at the 65th. . . . Now just for the sake of coherence: Be sure to reply to President Edgerly's questionnaire if you have not yet replied. If possible come to Alumni Day, June 11, 1962, to discuss how we can best celebrate the 65th. And remember, the 65th comes a year later, in 1963. Come, if possible, and practicable!—**Edward S. Chapin**, Secretary, 271 Dartmouth Street, Boston 16, Mass.; **Frederic A. Jones**, Assistant Secretary, 286 Chestnut Hill Avenue, Brighton 35, Mass.

'99

We have received some further biographical data about Miss **Alda Heaton Wilson**, architectural engineer, who died July 25, 1960. Miss Wilson was born at Harpers, Iowa, on September 20, 1873, the daughter of John Chesney and Olive Heaton Wilson. She received a B.C.E. at Iowa State College in 1894, was employed by a Chicago architect from 1895-97, and did graduate study at M.I.T., 1897-99. From 1904 to '18 she was employed by the state of New York, and was superintendent of the Women's Drafting Department of the Iowa Highway Commission from 1919 to '21. She was engaged in various architectural undertakings in 1922-24 and navigated the globe in 1924-25. From 1928 until her retirement in 1947 she was companion to Carrie Chapman Catt, well known suffragette. She was a member of the American Association for the United Nations, the Foreign Policy Association, and Pi Beta Phi sorority.

We hope the members of the Class of '99 have maintained their reputations for generous contributions by giving to the Second Century Fund and to the Alumni Fund. And don't forget to visit the In-

stitute on Alumni Day, June 11.—**Percy W. Witherell**, Secretary, 84 Prince Street, Jamaica Plain, Mass.

'01

One by one our classmates slip away. I have to report the death of **Alfred DeW. Nutter**, I, in Pittsburgh, on March 8, 1962. He was 84. He had diabetes for many years but died of a heart attack. A design engineer of some of Alleghany County's major bridges, he worked in the Bureau of Bridges, Alleghany County Department of Public Works from 1904 until he retired in 1933 as chief design engineer. He was a member of the Presbyterian Church and one of its elders. He is survived by his wife, one daughter, two sons, a sister, numerous grand- and great-grandchildren. . . . If you have ever had a personal letter from **Edward H. Davis**, IX, Waterbury, Conn., you know that he is a miserable penman. The following is what I interpret from his reply. "As class agent I have kept our group posted on the Alumni Fund developments. So now I give everybody a roundup of our class record from the headquarters report at the end of 1961. 22 of our members came across with gifts against 17 the year before. (More have come in since.) The total contributions exceed the previous year by over \$100. The gifts to the Second Century Fund show a total greater than that of the Alumni Fund. In short, we people are right on top of our responsibilities, and I personally feel gratified no end. Individually, I am the same old cricket and am on top of the world."

Benjamin F. Clark, Jr., II, Washington, N. J., writes: "Oh yes I can still write, also drive a car limited distances, take daily walks and read a lot." . . . **Charles I. Auer**, III, El Paso, Texas, reports: "Recently I sent Ed Davis money for class dues. I am secretary for two organizations, Pioneer Association of El Paso and El Paso Volunteer Firemen's Association, an old organization when El Paso had no paid fire department. It has a splendid fire department today, and we keep up the tradition for old time's sake. I know what it is to get members to be somewhat active and thus give the secretary a little help. Labor union and veterans group meetings are well-attended and its members helpful because both are generally after something, usually money. I am past 82 years, but keep going all the time and until October 23, 1961, when I fell, I was very active and went to my office daily. I went to prep school with **Greta Gray** and her brother in Ohio from which Greta and I entered Tech. I am very active in masonry. I also serve as precinct judge for city, state and national elections. We have three great-grandchildren. My daughter and husband live with Mrs. Auer and me in our home. Best of regards to all 1901 classmates who might be interested."

Charles Bittinger, XIII, Washington, D. C.: "I received your last letter in which you commented on your class-

mates being so lazy and where they could go. This makes me write in reference to M.I.T., the Navy and High Art—three activities of interest to me. I have just finished a portrait of Ned Cochrane, who as chief of the Bureau of Ships built more ships than anyone else in the world. He was also head of M.I.T. Naval Architecture and Engineering." . . . **George W. Allen**, II, East Bridgewater, Mass.: "My eyesight has gone to such an extent that I cannot see to read or even see what I have written."—**Theodore H. Taft**, Secretary, Box 124, Jaffrey, N.H.

'03

Because of the absence of any news from our reposeful members, your secretary has again resorted to historical notes that should stir the emotions by vividly recalling our former college life. In opening the M.I.T. Technique of 1903. I was amazed to learn that **Howard S. Morse**, I, was editor-in-chief of the year book, **George B. Wood**, II, society editor, and **Lawrence H. Lee**, VI, and **Hewitt Crosby**, XIII, statisticians. **Andrew H. Hepburn**, IV, was art editor, **John T. Cheney**, II, business manager and **Paul R. Parker**, XII, assistant business manager.

We read in the Senior Class History of the student reclining in a Morris chair before an open fire. Even then he was apparently overcome by sleepless moods and reminiscences. He looked backward over his four years at the Institute to September 29, 1899, when he was introduced for the first time to his classmates. He met the Bursar that day in his ornate office just inside the entrance to Rogers; he asked if the President's Office on the left was the place to hang his hat, even though the sombre oak door should have proclaimed otherwise. Next, he was likely to notice the bulletin board in the hall, which announced such alluring activities as "Military Drill." This activity required tight-fitting plain blue cloth trousers and a jacket with a small straight collar. This was tailor made, and the cap was of Civil War type with a straight visor. The cap was marked simply by a small M.I.T., but the effect was strikingly distinguished.

The second year was marked by student's apparel in loud colors and bulldog pipes. Students fraternized at the Plaza and the Old Elm, but were strangely refused membership in the YMCA, whose building was only a few yards from our favorite perch, the broad flat capstone on the upper landing of Rogers front "escalier." . . . The Technique also notes that Paul G. Hilken, '01, was the student who established the famous Cane Rush.

The problem of room and board for students was being considered by the authorities, even though the majority of students in those days were local residents. Eventually the housing problem was solved by the erection of Technology Chambers "by men interested in students, who would make the rates as low as they could to still afford a small margin of profit." So these are some of the memories of the senior student in

1903 and of the Alumni now, who in looking over our former abode on Boylston Street, would never have visualized the numerous structures that comprise our M.I.T. today.

Another note of interest comes from an article about the Walker Memorial Movement, which accentuates M.I.T.'s relative youthfulness. It has been only within the last decade or so that the Institute has approached its present proportions; the number of Alumni in 1903 was relatively few. Nevertheless a strong Alumni Association was formed with many local clubs in various sections of the country. Each class after graduation continues its formal organization and through its secretary keeps in touch with the Alumni. These secretaries themselves have formed the Association of Class Secretaries which, in fact, is the bond that unites the various classes and is a sort of nucleus of the whole Alumni structure. These facts, when viewed with the extraordinary advances made by M.I.T., are a glowing tribute to M.I.T.'s presidents and efficient Faculty.—**John J. A. Nolan**, Secretary, 13 Linden Avenue, Somerville, Mass.; **Augustus H. Eustis**, Treasurer, 131 State Street, Boston, Mass.

'04

Just a day late for mentioning in our last batch of notes was a card from **Frank H. Davis**. This boy moves around. It was not so long ago that he reported from the Orient. This card was from Arizona where Frank and his wife were escaping the cool breezes that were blowing around Detroit at that time. . . . **Gus Bouscaren** is heard from again. This time he sent a brief but interesting account of a hair-raising and near fatal experience of his youthful days in the family home in Kentucky. This might be script for a short movie. . . . After a brief respite from obituaries we regret to report the passing of **Dennie K. Keller**, Course IX, on February 26 in New York. No details were available. . . . If you read this before Alumni Day why not join us at the noon luncheon?—**Carle R. Hayward**, Secretary, Room 35-304, M.I.T., Cambridge 39, Mass.; **Eugene H. Russell, Jr.** Treasurer, 82 Devonshire Street, Boston, Mass.

'05

You have received by now notice of the 1962 dues assessment (\$5.00). I had not foreseen it, but it seems that as the class roll gets shorter, the cost of getting news for this column, postage, flowers for funerals (when information is received on time), memorials, etc. increases. I still remember the time when we used **Grove Marcy's** slogan "dues to end all dues" (and believed it). Each dues assessment since has caused considerable embarrassment. You will also have sent in by the time you read this your reservation for the Alumni Day Luncheon and Dinner. Here's hoping we may have as large a group as in recent years. . . .

Andy Fisher has sent me a clipping from a Boston paper telling of the appointment of Dr. Leonard W. Cronkite, Jr. as general director of the Children's Hospital Medical Center in Boston. I quote briefly: "Dr. Cronkite is the son of **Leonard Wolsey Cronkite**, Cambridge manufacturer of medical instruments. His stepmother is Bernice Brown Cronkite, who served as dean of the Radcliffe Graduate School until her retirement last year." . . . **Charlie Smart** writes me that he was married in Florida about Christmastime to a widow, who had been a close friend of the family for years. Congratulations, Charlie. We expect to meet her on Alumni Day.

I have a post card from **Prince S. Crowell** (via **Andy Fisher**) which tells that he and Ethel were on their way to the Swan Islands, "where the Pacific Guano Company of New Hampshire" (I'll have to look that up) get their guano. . . . A letter from **Hub Kenway** stated that he and Helen were at Guana (not guano), British Virgin Islands in February. . . . We have quite a travelogue letter from the globe-trotting **MacBriars**, this time in Australia, New Zealand, etc. I have read the letter over three times and have enjoyed it so much, that I am here quoting parts of it: "Well, the MacBriars are on the go again, as you may surmise from the following. Ruth and I sailed from San Francisco on January 7 on the good ship 'Mariposa' of the Matson Line. It certainly is a fine ship, very comfortable and serves good food (too much). After a very calm voyage, we stopped at Tahiti January 18 for a couple of days, and saw all the sights there, which you can see in the night clubs of Paris or Las Vegas. Quite colorful in more ways than one. On January 20 the ship made an off-port call at the island of Rabotonga, and a bunch of natives came aboard and put on a show for the passengers. On January 24 we stopped at Auckland, New Zealand. Quite a number of the people left the ship at this port, but we stayed aboard and left the ship at Sydney, Australia, on January 28. Sydney is a large city with a wonderful harbor. We were there about a week and while there visited a sheep station about 200 miles north of Sydney. Then we went to Canberra, the capital of Australia. The ground for this city was purchased about 60 years ago and originally was a sheep station of about 600,000 acres. The city proper will occupy about 9,000 acres. Most of the building has been done in the last 10 years and at the same rate, it will take at least 100 years to complete it. It is now an overgrown village of 60,000 people. From Canberra we came to Melbourne, arriving here February 6. Tomorrow, the 10th we fly to the island of Tasmania for a couple of days. Then back to Melbourne, and the next day we fly to Christ Church on the south island of N.Z. Then we do the south island and north island by air and bus, and meet the good ship 'Monterey' at Auckland, N.Z., and sail for San Francisco on February 27. We visit Fiji and Suva and Honolulu on the way home, arriving at San Francisco on March 14. Probably as usual we will be glad to get home." Here's a pre-

diction—that they will take the short jump across the U.S.A. to be with us at our 60th.

From the desk of Carole A. Clarke, Secretary of the Class of 1921, comes a clipping telling of the sad death of **William G. Houskeeper**, II. I quote: "An auto crash resulted in the death yesterday (March 24, 1962) of William G. Houskeeper, 79, of Kemah Lake Road, Newton, N.J., a scientist and inventor who held 141 United States and foreign patents. Houskeeper, who made important contributions to long-distance radio and wire telephone transmissions in the late 1920s, died in Newton Hospital five hours after he was injured in the collision. State police at the Hainesville station said Houskeeper's 1960 compact auto was struck broadside at the intersection of Route 206 and Kemah Lake Road near this Sussex County community. Police said Houskeeper suffered fractures of the skull, spine and ribs. Houskeeper, who was born in Coatesville, Pa., and moved here from South Orange in 1942 retired in 1929 after a brilliant career in electrical engineering for the Westinghouse Electric Company, Pittsburgh, and the Bell Telephone Laboratories of New York. In the early part of the century, Houskeeper, then in charge of Westinghouse's lamp filament division, invented and developed semi-automatic machines for the production of tungsten filament in lengths of over twelve inches. . . . His studies in soldered connections resulted in a method of fusing glass and metal which became valuable in the construction of high-power electron tubes used in trans-Atlantic communication in 1923. His experiments in illumination were used to enable the partly blind to read newspaper print. Mr. Houskeeper was a graduate of the University of Pennsylvania and the Massachusetts Institute of Technology. He was a member of the Institute of Electrical Engineers and the American Society of Mechanical Engineers. He began his career as an assistant meter tester with the Philadelphia Electric Company, and later went to Westinghouse as an apprentice engineer. In 1925, he became allied with the Bell Telephone Laboratories in New York. Since his retirement, Mr. Houskeeper had worked on the development of a color process for photography."

Another shock comes in a clipping from the Portland Herald of March 27. Again I quote: "Philip E. Hinkley, 80, of 215 Vaughan Street, former head of production scheduling and the sales department at S. D. Warren Company, died at a local hospital Sunday March 25, 1962, following a long illness. Mr. Hinkley also was one of the organizers of the apprenticeship program at S. D. Warren Company. His first apprentice, George Olmsted, is now company president. Mr. Hinkley was born in Portland on October 30, 1881, son of Rufus H. and Frances Pringle Hinkley. He was educated in Portland schools, and was graduated from Portland High School, Philips Exeter Academy, and Massachusetts Institute of Technology. He belonged to the State Street Congregational Church and was a corporator of Maine General Hospital. He was also a member of the Portland

Club. He retired from S. D. Warren Company about 10 years ago. Survivors include three sisters, Mrs. Frank L. Quimby of Milford, Conn., Mrs. Philip Dana of Cape Elizabeth; and Miss Helen Hinkley, with whom he resided." I had heard little from Phil since he retired and left Boston. Our offices were close at hand, and I lunched with him occasionally, but he didn't like to talk about himself (he was a bachelor) and he never wrote letters, at least as regards class matters.—**Fred W. Goldthwait**, Secretary and Treasurer, Center Sandwich, N. H.; **Gilbert S. Tower**, Assistant Secretary and Treasurer, 35 North Main Street, Cohasset, Mass.

'06

In the April notes, in quoting from **Bill Abbott**'s letter about life at Tech Chambers, I reported that 28 classmates were living there our senior year. On recheck I find there were 29, and to stimulate some fond memories here is that roster—Course I: Howard Barnes, Terrell Bartlett, Ralph H. Burke,* Arthur M. Chidester,* and Charles A. Holmquist; Course II: Edwin D. A. Frank,* Herman C. Henrici,* Stanley M. Udale; Course III: William J. Deavitt* and John A. Root,* Course IV: Henry B. Thomson, John H. Cady, Samuel E. Gideon,* Alfred W. Hertz,* Fred C. Lebenbaum,* and Paul F. Mann;* Course V: Edward C. Groesbeck,* Lambert Thorp,* Frank F. Hasbrouck; Course VI: Edward M. Eliot,* Andrew B. Sherman, Michael J. Gibbons, Isa W. Kahn, and Laurence E. Stone;* Course VII: Edgar C. Steinharter; Course XI: Thomas L. Hinckley; Course XIII: Howard H. Brown,* Nathaniel A. White and Carl F. Edwards.* Of the total of 29, 16 (55 percent) are deceased* as of February 1, 1962.

You probably received several months ago the preliminary Alumni Day program for Monday, June 11, and we hope that all the regulars and some irregulars will be on deck that day. The luncheon, as usual, will be held at noon under canvas in the main court, and so why not gather before then at the entrance to Building 10 (under the big dome) comfortably seated with a fine view of the Great Court in all its spring beauty, and start comparing notes? Likewise why not change seats during and/or after the eats. It's the only time during the day we will all be together. . . . One of the regulars was bitten by a bug last year and so missed our 55th and Alumni Day. **Bill Abbott** wrote me late last June: "I was greatly disappointed not to be present on the 12th, because it is one of the few times I have a chance to make contacts with classmates and friends in other classes.. Also the chances of being around at future five-year periods grow a little dim." So, why not make them one-year periods for getting together? Being a regular, Bill has been on deck every year, for many years. He concluded that letter with an invitation: "As always the latch string is out for any passing this way, at my place on Chappaquoit Road, West Falmouth."

Early in April **Bob Cushman**, II, wrote that he expected on the 8th to attend a joint dinner meeting of A.S.C.E. and A.S.T.M.—the Oregon Sections—when the speaker was to be Miles N. Clair, I, '23, President of A.S.T.M., of which you may recall, **Herb Ball**, II, is a past president. Bob was president of the Oregon Section of A.S.C.E. some years back. . . . Here are two address changes: **Ralph N. Sargent**, X, early in the year moved up from Florida to c/o Jack Kent, 3306 Cummings Lane, Chevy Chase, Md.; **Karl F. Juengling**, II, has moved from the west side (Lakewood) to 18710 East Shoreland, Cleveland, 16, Ohio. **Jim Wick**, II, really has two addresses as he hops back and forth between Youngstown and Rockport. He and Clare were in Rockport for several weeks in April and May, and Jim expected to be back there in June and to attend Alumni Day. Will you be there too?—**Edward B. Rowe**, Secretary-Treasurer, 11 Cushing Road, Wellesley Hills 81, Mass.

and here, also, his active support had been a life interest. He did so much for so many individuals, and for so many causes, that it would be difficult to enumerate them. But he did everything so modestly and quietly that as a rule his generosity was not traced to its source." The May edition of Yachting Magazine will contain an account of our classmate. Becky attended our 9th Reunion in 1916 at Hotel Englewood on the Cape.

Your Secretary is interested to find out which '07 man has the greatest number of grandchildren and great grandchildren. **Seymour J. Egan**, of Wakefield, reports 14, while **Parker Dodge** writes his 17th was born April 5. Drop me a card if you can top this number.—**Philip B. Walker**, Secretary-Treasurer, 18 Summit Street, Whitinsville, Mass.; **Gardner S. Gould**, Assistant Secretary, 409 Highland Street, Newtonville, Mass.

'07

By the time these notes are published, our 55th Reunion will be only a week away, and all '07 men will soon receive the revised list of living class members. Work on this is well underway, and its completeness will depend on the information I receive from each class member in response to the request I made in the reunion flyer. I am still receiving replies to my request for dues, accompanied by interesting notes from the writers, from which I quote below. . . . **Albert H. Donnewald**, III: "I am in excellent health and have plenty of personal interests to keep me fully occupied, although retired. Shawnee, Okla., is too far from Oyster Harbors for me to make the trip. Regards to all my old classmates." . . . **Floyd A. Naramore**, IV, writes from Seattle, Wash.: "I served five months in a hospital last year, and the result from that is the only thing that will prevent me from attending the 55th Reunion. Am lucky and recovering fast."

The Alumni Association has sent me notice of the death of two of our non-associate members. **Francis E. Daniels**, VII, died on April 5, 1962. His address was 4017 North Second Street, Harrisburg, Pa. For many years he was chief of the Waste Section of the Pennsylvania Department of Health. . . . Commander **John H. Walsh**, XIII-A, died on March 4, 1962 at Pass Christen, Miss. During World War II, I recall his coming to Whitingville to award a maritime "M" to the Whiting Machine Works for excellence in manufacture of war supplies. There is no other information in our archives regarding either of these men. . . . A letter from a daughter of **Karl (Becky) Sharp**, XIII, informed me of his very sudden death on March 8 in New York City. I quote: "My dear father remained deeply attached to his college memories and friends and regretted greatly his inability to return in late years to class reunions. His family had founded the Nantucket (Mass.) Hospital in 1912;

'08

June is nice on the Cape. Why not spend a weekend there at our 54th Reunion? We will be at the Melrose Inn, Harwichport, Mass., June 8, 9 and 10. This is our sixth visit with the Smiths, and I know you will have a good time. Ladies are invited. Please let us know if you can be with us. Our reunion winds up at Alumni Day at Cambridge on Monday, June 11. There's lots to see at Tech, as well as meeting old friends of other classes. Better make it. . . . It's not too late to make a gift to the 1962 Alumni Fund. How about it?—**H. Leston Carter**, Secretary, 14 Roslyn Road, Waban 68, Mass.; **Joseph W. Wattles**, 3rd, Treasurer and Assistant Secretary, 26 Bullard Road, Weston 93, Mass.

'09

We heard from **Art** and **Betty Shaw** from Gulf Ranch, Longboat Key, Fla., where they usually spend the winter. Art writes: "We are here at our customary stand enjoying lazy Florida living in the sunshine and swimming in the Gulf which is presently about 64 degrees, quite acceptable to us who are accustomed to New England water temperatures. We expect to return about May 1." . . . We received a letter from Blanche Johnson from her home in Rockland, Maine, containing a clipping headed with heavy type, "U. S. Power Squadron Dedicates Its First Textbook to **Lewis H. Johnson** of Rockland." There was an excellent picture of Lewis in his full uniform with skipper's cap. The squadron wrote Mrs. Johnson: "You will be pleased, as we are, that the first textbook of the U. S. Power Squadron has been dedicated to Lewis Howes Johnson as the first director of education of the U.S.P.S. It is entitled "Marine Engines and Equipment," and we hope it will be the first of a series of such textbooks dealing with the various courses given by U.S.P.S." Boating and nava-

tion were Lewis' chief hobbies. In addition to being the first U.S.P.S. director of education, he served as a national vice-commander of the organization and held the title of navigator, a coveted honor. He taught a course in celestial navigation and received a silver tray in January, 1949, for service to U.S.P.S. We have already told of Lewis' successful career as an engineer with the Bell Telephone Laboratories, a position which he held until his retirement to his native Rockland.

We were most happy to receive from Professor **Thomas F. Hickerson**, I, of Chapel Hill, N.C., a sheet describing his new book, "Echoes of Happy Valley," which is a sequel to his earlier book, "Happy Valley." The book covers a period of nearly 200 years from 1766 to the present and throws light on many prominent North Carolina families as they cross paths with famous American figures such as Robert E. Lee, Andrew Jackson, and Zeb Vance. There are letters relating intimately to events of the Civil War, including unusual descriptions of Generals Lee and Longstreet. Thomas also sent us a complete page of the Durham Morning Herald, a considerable proportion of which was devoted to him and his book. It showed a picture of him at his desk in his library, and aside from a few gray hairs the picture closely resembles that in the Class Album. He became a Kenan professor at the University of North Carolina in 1945 and retired in 1952. His professional work in highway construction earned for him an international reputation and his book, "Route Surveys and Design," was a recent McGraw-Hill Book-of-the-Month Club selection. Then later we received a copy of a letter to **Tom Desmond**, I, which is as follows: "Chester L. Dawes writes that your wife, Alice Desmond, is the author of a book dealing with "The Glamorous Dolly Madison." Just last Sunday, while on a historic tour of Guilford County N.C., I saw the Dolly Madison Rooms in the very interesting and complete City of Greensboro Museum. In a book entitled "Echoes of Happy Valley" (a copy on the way with my compliments), there is a reference to 'The Majestic Dolly Madison' (pages 9 and 10)."

In the May notes we told of the passing of **Earl R. Hamilton**, VIII. We not only wrote to his wife, Katherine, but called her on the telephone expressing the sympathy of the class as well as our own and requested any information relative to Earl which she might send. Mrs. Hamilton sent the following stating, "This may help you for the June issue. It was one of the high spots of Earl's life to be with his class at the 50th Reunion." . . . "Mr. Hamilton was born on June 16, 1886, in Somerville, Mass., the son of William Elmer Hamilton and Alida Lee (Gibbs) Hamilton. He was graduated in 1905 from English High School in Boston. He enrolled at the Massachusetts Institute of Technology and was graduated in 1909 with a degree of bachelor of science in electro-chemistry. New England Electric System records show that he was employed by the Stone and Webster Engineering Corporation as general superintendent of an engineering and construction project in Nova Scotia from 1919 to

1925. He was president of the Canadian Gas Association for two years, which was quite an honor for an outsider. In the period from 1925 to 1929 he was engaged in engineering with the West Gas Improvement Company. On April 8, 1929, he entered employment as an engineer with Charles H. Tenney and Company. He continued in this position with the Tenney Company and its successor, New England Electric System, until his retirement on June 30, 1951. During World War II, on leave of absence from New England Electric, he rendered assistance of great value to the War Production Board. This tour of war time service extended from December 1, 1942 to June 1, 1945."

John A. Davis, II, sent us a clipping telling of the death of **Carlton D. Jacobs**, II, age 75, on February 22 at West Harwich, Mass. He was a former owner of a Boston engineering firm and served in the Army Corps of Engineers in both world wars, retiring as a colonel. He was a member of the First Corps of Cadets, the U. S. Power Squadron, St. John's Masonic Lodge of Boston, and the Congregational Church of Harwichport. He was a trustee of the Suffolk Savings Bank of Boston and past president of the Military Engineers of Boston. He leaves his wife, Elsie; two sons, Philip R. and Peter T., and a daughter, Mrs. Philip C. Ellis of California. We all remember Carl as a most genial companion in the classrooms and the old drawing rooms. We have written to Mrs. Jacobs expressing the sympathy of the class as well as our own.—**Chester L. Dawes**, Secretary, Pierce Hall, Harvard University, Cambridge 38, Mass.; Assistant Secretaries: **George E. Wallis**, Wenham, Mass.; **Francis M. Loud**, 351 Commercial Street, Weymouth 88, Mass.

'10

Harold N. Cummings died March 14, 1962. The following is from a clipping from the Newark Evening News sent to me by **Gordon G. Holbrook**: "Harold N. Cummings, an engineer for Curtiss-Wright Corporation and a retired vice-president of Newark College of Engineering, was found dead yesterday at his home, 695 Grove Street, Upper Montclair, apparently of a heart attack. He was 77. Mr. Cummings retired from N.C.E. in 1950 after serving the college 30 years. He had been employed the last 10 years by the Curtiss Division of Curtiss-Wright as a consultant in metals fatigue, in which field he was an authority. Mr. Cummings was born in Oxford, Maine. He received a bachelor of arts degree from Bates College and a bachelor of science degree from M.I.T.

"In 1920, Mr. Cummings came to N.C.E., together with the late Dr. Allan R. Cullimore, first president of N.C.E., who also had been on the University of Delaware faculty. Mr. Cummings served as professor of applied mathematics until 1927, when he became head of the newly established civil engineering department. He was appointed vice-president in 1942

and named vice-president emeritus on his retirement. Mr. Cummings was the author of several Air Force manuals on metals fatigue. In 1956, he was one of the few American scientists invited to an international conference in London on metals fatigue. In 1960, N.C.E. awarded him its first honorary master of engineering education degree. He was a life fellow of the American Society of Civil Engineers and a fellow of the American Association for the Advancement of Science."

With the above, Gordon wrote that he was pinch hitting for **Carroll R. Benton**, who was taking a spring vacation in Florida. . . . In the April Class News, I mentioned that **Phil Harris** wanted a 1910 Technique. It paid off. **Harold E. Akerly** sent me a copy which I have sent to Phil. Harold has been vacationing in Florida and is returning to Rochester where he expects to give up his home and become an apartment dweller very soon. . . . I have heard indirectly that **Jim Tripp** is now spending his time visiting his grandchildren in California; he has been connected with various jobs in many parts of the world.—**Herbert S. Cleverdon**, Secretary, 120 Tremont Street, Boston, Mass.

'11

A letter in April from **Leroy Fitzhert**, I, said: "My wife and I returned home about three weeks ago from a six-months sojourn in Europe, most of the time having been spent in Spain. We enjoyed our stay and we found the Spanish people delightful, the winter sunny and mild, and the cost of living still very reasonable. Expect to do yard work this spring until the weather gets good enough for us to go to our cottage in Essex for the summer. I noted with sorrow that **Dick Ranger** had passed away. He looked so Hale and active at the reunion." . . .

Allston Cushing, I, wrote that as of January 1, 1961, he became a life member of the American Society of Civil Engineers and of the Missouri Society of Professional Engineers. . . . We have address changes for: **Ormond R. Bean**, IV, 2545 S.W. Terwilliger Boulevard, Portland, Ore.; **Lloyd C. Cooley**, X, 7321 South Shore Drive, Chicago 49, Ill.; **Norman Duffett**, X, back from Lake Worth, Fla., to 909 James Avenue, Niagara Falls, N.Y.; **Charles W. Homeyer, Jr.**, I, 106 Ligustrum Street, Robstown, Texas; **Howard D. Williams**, XI, from Los Angeles, Calif., to Beverly Wilshire Hotel, 9500 Wilshire Boulevard, Beverly Hills, Calif.—**Henry F. Dolliver**, Secretary, 10 Bellevue Road, Belmont 78, Mass.; **John A. Herlihy**, Assistant Secretary and Treasurer, 588 Riverside Avenue, Medford 55, Mass.

'13

When you read these notes, we shall be preparing for M.I.T. Alumni Day, June 11, 1962. Again, we wish to remind

you that just 12 months from now the Class of 1913 will be the honored class at the 50th Reunion. . . . We have received a very sad but informative letter from **Leon Katzenstein's** widow, Ann. We quote in part: "Am enclosing the clipping from the newspaper. Leon passed away January 30, 1962, at the age of 70. After he left M.I.T. he worked for Norton and Company in Massachusetts as an engineer for quite some time. In 1931 he came back to St. Louis as his father was ill, and Leon never went back to Massachusetts, as after his father's death, he thought it advisable not to leave his mother as he was the only child. He then went into teaching. He taught the sciences and then later became program chairman for the Hadley School. He also worked in the evenings as an assistant principal. During the summers he worked for Monsanto Chemical Company as a teacher trainer. He retired from his teaching profession in 1956. Leon wasn't happy in retirement as he always liked to keep busy, so he became a counselor for one of the local banks on a part-time basis, which work he enjoyed up until the time of his passing. You can see from the above resume that he led a full and active life and was never happy when idle. My loss is very great, but I will always treasure the wonderful memories of my life with him. I have his graduation book which I will always cherish." Leon is survived by his dear wife, Mrs. Ann Katzenstein, and his mother, Mrs. Emma Katzenstein. To this grieved family we offer our most sincere sympathy, for we also share the loss.

Your 50th Reunion Chairman, **Phil Capen**, has selected a General Local Reunion Committee of 13, including, Charlie Thompson, Ellis Brewster, Lester Gustin, Joseph Cohen, Francis Achard, Charles Brown, David Stern, Hilding Carlson, Charlotte Sage, Lawrence Brown, William Eichorn, and Burton Cushing. Several other regional committees will be appointed later in the year. We shall be pleased to receive acknowledgements from those already nominated and volunteers for the regional groups. . . . It is with deep regrets that Mrs. **Maurice E. Levy** informs us that another classmate, her husband, passed away March 3, 1962. We have written Mrs. Levy for more details, which we hope to include in the next issue of our notes. . . . Again the **Brewster** Family is in the news. **Bill's** son, William S., early in March was one of five members of a seminar at Boston College to furnish remedies or benefits for the Port of Boston. . . . Again in passing, the Class of 1913 has lost an honorary member, Dr. Samuel C. Prescott, M.I.T. scientist, educator, and member of the Class of 1894. Together with the other thousands of Tech Men, we bow our heads in prayer for one of the most loyal M.I.T. graduates and supporters. . . . It was very pleasing to receive a joint letter from **Bill Mattson** and **Charlie Thompson**, written in early March from Denver, Colo. The Thompsons have since returned to West Newton, and we have been in touch with him several times by phone; we understand that Charlie has joined the 'unemployed,' which is difficult to realize. Evi-

dently Bill and Charlie enjoyed their preliminary reunion and we quote in part: "Of course, Charlie and Anne will be at the 1913 Class Reunion at Oyster Harbors next year. Jo and I will try to make it if possible, even though we are 2,000 miles from Boston. Charlie and I are feeling so well, we can't believe this will be the 50th Reunion. As one grows older the months and years seem to go faster and faster. We are full of pep and energy, but not so much as we had when we both ran on the 1913 Class Relay Team that broke all records up to that time, 50 years ago."

Again, we find more sad news in our daily paper. On April 10, Clara P. Burt passed away. She was **Philip V. Burt's** wife and she had been ill for many months. We who knew Clara regret that she will not join us at our reunion. To our friend of over 50 years, Phil, we extend our most sincere sympathy in these hours of mourning. . . . Even the most husky and well-rounded pals can't battle the ravishes of Old Man Time and those little bugs called viruses. We have lately talked to **Frank Achard** several times, and he has returned from a two week's sojourn at the hospital. He reports that after another week of rest at home he will return to his usual endeavors. Many of our classmates are constantly on the move, so here are a few of new addresses: **W. George MacTarnaghan**, 604 Mountain View Avenue, Bluefield, W.Va.; **Alexander J. Pastene**, 146 Landham Road, Sudbury, Mass.; **Edward D. Pratt**, General Delivery, Melbourne, Australia; Dr. **Leon W. Parsons**, Suffield Academy, Suffield, Conn.; **Louis C. Rosenberg**, Westway Road, Greene Farms, Conn.; **Alfred L. Higgins**, 70 Governor Road, Milton 86, Mass.; **John W. B. Ladd**, 32 Cedar Lane, New Canaan, Conn.; **Walter P. Muther**, Stage Road, Westhampton RFD, Easthampton, Mass. . . . So until the next issue, don't forget your date, June, 1963.—**George Philip Capen**, Secretary and Treasurer, 60 Everett Street, Canton, Mass.

'14

Some of these retired classmates know how to live. **Frank S. Somerby**, who has a master's degree from Columbia, has been a teacher in New York for many years. Now he has gone into quiet retirement and has bought a house in Sarasota which has a swimming pool, recreation hall, beach, etc. Only living there for six months of the year, he moves to New Hampshire for the summer. Perhaps it is because Frank has taught calculus in secondary school and all the way up to second year college that he is so successful. This summer he will visit Colorado and the West Coast, including the Seattle World's Fair in his itinerary. Last year Frank visited 19 countries abroad. . . . Then there is another retired classmate, **Clarence L. Smith**, who spends half a year in Isle of Palms, Treasure Island, Fla., and returns to Seymour, Conn., just for the summer.

While visiting the Fiesta in Mexico City, **Homer Calver** met Lobbie wandering around. Then he met **Jim Reber** in Houston. Jim had come all the way down from Auburn, N.Y. Likewise your secretary strayed far, far from Boston and met **Thorn Dickinson**, who resides right on 55th Street and Broadway. Thorn is just getting ready to pack up and wander again in the wilds of the Adirondacks. He makes his headquarters at Elk Lake, N.Y. . . . Many others have taken up Northern residence, only during the warm season. One such is **Leigh Hall**, who comes to Concord, N.H., for a long summer. But no itinerant classmate could outdo **Charlie Fiske**, who really takes things in wide steps. He has just spent the long winter in Barbados, and his letters certainly made your secretary envious. . . . **Dean Fales** managed to run down to Sebring, Fla., to see the annual races. His card shows that he was staying at the Florida Brethren Homes, but as it is Lent, he has pulled down the shades on his other activities. . . . And who could be more active than our retired **General Alden Waitt**? Most of the classmates know that after retirement he took up painting for amusement, but how many of us realize that he had become a true professional in these very few years? The true rewards come from the exhibitions and sales. Alden has exhibited in the Beaumont Art Museum in February and in other exhibitions in the Southwest. He showed 25 paintings in the Beaumont Museum and sold many of them at prices equal to or more than we paid for one year's tuition in our old M.I.T. days. . . . **Clifford R. MacKenzie** of Fitzwilliam, N.H., died on February 19, 1962. He came to the Institute for a short time and there is no other data available.—**H. B. Richmond**, Secretary, 100 Memorial Drive, Cambridge 42, Mass.; **C. P. Fiske**, President, Cold Spring Farm, Bath, Maine; **H. A. Affel**, Assistant Secretary and Class Agent, R.F.D. 2, Oakland, Maine.

'15

Everyone, all classmates with their guests and families, is invited to our Annual Class Cocktail Party, Alumni Day afternoon, June 11 at 4 P.M. at the M.I.T. Faculty Club, 50 Memorial Drive, Cambridge. **Al Sampson** and **Barbara Thomas** have been working hard to make this as enjoyable and as successful as our previous get-togethers. Plan to be there; everyone is welcome. . . . Our nomadic classmates continue to nomad. Entrancing picture postcards with weird stamps and postmarks from them all over the world come to me. **Herb** and **Alice Anderson** in Cairo; **Max** and **Catherine Woythaler** at the M.I.T. Fiesta in Mexico City aggravating us with the reminder that we, too, would enjoy it down there; **Wink** and **Kath Howlett** at Montego Bay, Jamaica, changing their old Scotch taste over to Rum; **Harry** and **Lucille Murphy** in Milano on their way to Rome and Paris (ah, me); **Jerry** and **Verta Coldwell** reminding us with a "how about it" that

the water temperature was 76 degrees and there was no snow in Naples, Fla.; **Vince** and Marion **Maconi** playing golf and swimming at St. Petersburg Beach. There must be many others we have not heard from. A hard winter! PFC (major to us) Gerry **Rooney**, son of our own **Pirate**, was honorably discharged from the United States Marine Corps late in March and at once became associated with George in his business. All our best to Gerry for success and happiness in his new work and association with his able father. This should make an outstanding team. Gerry has been with us at several class parties and he will always be welcome.

In the November and December 1961 issues of "Yachting" **Evers Burtner** had a long story about Professor George Owen, '94, one of the nation's foremost designers of sailing and racing craft. . . . We're all pleased to know from **Sol Schneider**'s letter that his wife has recovered. Her sudden illness kept Sol from the New York Class Dinner. "Ann was in the hospital for over three weeks and was very sick. She is now home and doing much better. I note there was a big attendance at the January Class Dinner in New York, which I missed for the first time. **Larry Bailey** wrote wondering where I was and said when he is in Philadelphia in April he wants to go out to see Andy. Andy and Alice are on a two months' Mediterranean cruise and will return early in April. Have you heard from them? (see above) I talked with Andy before he sailed." . . . **Henry Daley** has something to say about that New York dinner: "I thoroughly enjoyed the class party in New York, not only the excellent dinner but the chance to see so many of the old gang again. And let's not forget the 'lease-breaking' singing in the class headquarters upstairs, later in the evening. A noisy crowd, eh, what, Sing-along-Mitch certainly has worthwhile competitors." I think Henry is being very generous and gracious in his remarks! . . . And another from good old **Bur Swain**, who worked to make the New York dinner so enjoyable and successful: "I had a beautiful time that night and cannot get over the boys just sitting around to talk after dinner. It was most agreeable." It's so rewarding to hear from our classmates in this manner. . . . **Warren Cowles**' wife, Imogene, writes a pleasant letter: "We always read your Class News with great pleasure. As a result of Warren's retirement from the Hackensack Water Company, we have been very busy. He is studying the programming of high-speed digital computers. The dinner was just when Warren had exams to study for. He took an introductory course in computers, and a course at New York University last term, and is now continuing. At Fairleigh-Dickinson University, he took a course in the 1620 Computer. When the new installation is complete at M.I.T., he's going up there. Our older son, Bill, expects to receive his doctor's degree this spring from Yale in electrical engineering. He has been a full time instructor there in electrical engineering for several years; the younger son, Warren, is doing graduate work at New York University in chemical engineering. Both are married

and Bill has two children. We hope to see you in June."

Late in February Fran and I hurriedly decided on a Grace Line South American cruise. The sailing date was twice postponed so when we arrived at the ship in New York on a cold and rainy afternoon we were just a little downcast. Suddenly, Bur and Joanne Swain appeared on board. They had the friendly interest to continue checking with the line on the final sailing. After lunch in our comfortable cabin, the Swains, the dock and the ship floated away pleasantly aided and abetted by their bottle of sailing cheer. Then, on board, we met Ellis W. Brewster, '13, and his charming wife, Ellen. Their lovely company added a great deal to our pleasure and enjoyment of the cruise. Returning North, the ship stopped at Baltimore, where they left for their Plymouth, Mass., home and we really missed them. During our short stop there, **Bill** and Ethel **Spencer** took us to dinner and helped us enjoy a pleasant visit. At the next stop in Philadelphia, Henry and Frances Daley came on board to look around and then took us sight-seeing in Philadelphia. This all gave a delightful M.I.T. color to our trip, from which we found it hard to unwind. Our July column will carry the play-by-play story of the May 11 Boston Class Dinner.

It is sad to record the passing of these classmates: **Park D. Manbeck** died June 6, 1960; **Kendall P. Foster** died November 7, 1961; **John R. L. Santos** died December 12, 1961. **Ralph D. Waterman** died March 28, while on a cruise, at St. Thomas, Virgin Islands. Following his graduation in Course I, he went with Stone and Webster, Inc., Boston, as an engineer. In 1938 he was lent to E. B. Badger and Sons Co., Boston, for construction work on an oil refinery in Iran. He was executive vice-president of Badger from 1949 to 1951, when Badger was completely merged with Stone and Webster. In 1951, Ralph became vice-president of Stone and Webster Engineering Corporation, in charge of power plant and chemical plant construction. From 1953 to 1957 he was in charge of its foreign operations, with headquarters in London. He became a director in 1954 and retired in 1957. We recall Ralph's pleasant company at the New York City Class Dinner in 1961. He was always active and generous in class and M.I.T. affairs, and we shall all miss this outstanding classmate. The sympathy of our class goes to his widow, Mrs. Blanche Waterman.—**Azel W. Mack**, Secretary, 100 Memorial Drive, Cambridge 42, Mass.

'16

As the 46th Reunion approaches, in fact it is practically here, we have a message from our president, **Ralph Fletcher**, who says: "Come, oh come. Let nothing keep you from the event of the month, the 46th Reunion of the Class of 1916, at the Chatham Bars Inn, Chatham out-on-the-Cape, starting Friday noon June 8 and lasting until Sunday afternoon June 10. All this is just before Alumni Day in

Cambridge, Monday June 11. At Chatham we'll have a good golf course for those that want either pars or birdies, early-morning cold swims for those who thrive on invigoration, a shore dinner on Friday night if weather permits, some we-expect travel shots by **Irv McDaniel** all the way from Egypt, Ceylon, Burma, Thailand and all, wonderful meals including the class dinner on Saturday night, good conversation, and just a plain good time for all. Do come! Don't miss!" Ralph sends along some messages received on post-cards relative to the Annual Boston 1916 Dinner at Joseph's on April 12. **Emory Kemp** sent a card showing a front view of their new home at 4022 Winthrop Street, Sarasota, Fla. The Kemps had just moved in and were "busy planting the lawn and shrubbery and citrus trees in order to get the lawn up before the summer starts. We plan to come up to Northeast in June, 1963, and plan to see you-all (we put the hyphen in you-all—Secretary) at the 1963 Reunion. With best wishes to all 1916ers." Their home is located on lots that "have a lake, Pelican Lake, adjoining the back." Ralph reports other notes: one from Reverend **Ed Weissbach**: "Unfortunately, I have a church meeting scheduled for April 12." From **Tom Jewett**: "Hope to make the June reunion on the Cape." From **Charlie Lawrence**: "Have a good time. I'm thinking of you all. Not yet in full circulation, but much better. Aiming for reunion on Cape in June. Regards to all." **Ed Williams** writes: "Sorry but health prevents." From **Paul Hatch**: "My wife is in, and will at that time be in, the hospital and I usually visit her at dinner-time." The following is from **Howard Claussen**: "This is the busiest time of year with boats going into the water, instruction nearly every night in advanced piloting and navigation for the Coast Guard Auxiliary and Power Squadron, etc. However, if anything around this date calls me to Boston I will drop in. The date, time, and place are circled on my calendar. Wrote I. B. McDaniel pursuant to Harold's idea, and got a nice postal back from him in Bangkok."

We have an interesting kodachrome picture to add to our 46th Reunion display at the Cape. This shows two fine-looking gentlemen, bronzed and smiling and at ease amongst tropical greenery and flowers, over the caption "George Kittredge, '17 and **Willard C. Brown**, '16, at George's permanent retirement home at Barbados, B.W.I., February, 1962." How did this happen? This-a-way! Willard says: "Last year at Oyster Harbors, **Cy Guething**, I think it was, told me there was a bird named George Kittredge of the Class of 1917 who had retired and built a home on Barbados. I didn't know him at Tech but looked him up, enjoyed a delightful cocktail party at his place, and met some of the planters of the Island, and spent some time with them seeing all the ins and outs of the sugar business (Barbados' principal industry) which the ordinary tourist never sees." The Browns spent a month there. This was their second year and they are already booked at the Paradise Beach Club for next February. Willard says that stay-

ing a month or so, they are not tourists but visitors, "A tourist is the fellow who arrives the day after you did." Speaking further of George he says: "He is fine chap in every respect. He retired to Barbados after spending the last 20 years or so in Trinidad. Incidentally, he has on his own grounds a sort of 2-unit motel—very nice—which he rents to friends, including breakfast at his house across the drive. If one rented a little car, as of course we do, there are a wealth of places on the Island for lunch and dinner, and George's place is certainly to be recommended." Willard was about to drive from Cleveland to Disneyland on business (he's a consulting engineer, lighting); and for late May he's been invited again "to one of the fabulous Canadian trout clubs up in western Quebec north of the Ottawa River, where there are no fish except the native red Quebec speckled trout and fishing is about as good as it was in 1892 when the club was formed. Heaven for a trout fisherman. **Francis Stern** take notice!"

And speaking of Barbados, B.W.I., we had cards from the **Peb Stones**, who were also down there but later in March. They are apparently thoroughly convinced that this is one place to go. It was a new island to the Stones; last year they kept nearer home in the Virgin Islands. As Peb says: "Lots of Old World flavor and, of course, tropical climate. Square miles of sugar cane, many beautiful beaches and also a lot of rugged shoreline. Snorkeling has been fascinating with thousands of little fish of all colors, shapes, and peculiar habits. I followed a little octopus for 10-15 minutes—a strange beast. B.W.I. money is the usual medium of exchange, \$1.68 for \$1.00 U.S. Things are generally cheaper than in the other islands we have visited. Many Canadians are here for the winter months, friendly people. The Royal Yacht Club is quite exclusive but pleasant. Rum is cheap and effective—haven't had a martini for a month! No doubt will revert to character after March 23 when we return." . . . **Stew Rowlett** says, "We'll see about June. I'm retired you know. No more salary." We have however decided not to send Stew, or loan him, a card that Jim Evans handed us four years ago on retirement, which spells out in elegant type: "Retired," and has four corner additions: "No phone," "No address," "No business" and "No money." . . . **Cy Guething's** 50th Reunion at Exeter comes May 25-27; he says he and Gyps will be there. Since our 46th comes two weeks later, he tells **Jim Evans** that they could wait that long only if they were invited aboard one of Jim's *privae* yachts, and would prefer one with a swimming pool.

No matter where he goes, someone finds out who he is and asks him to talk. It happened again to **Bob** and **Pearl Wilson** as they tried to take a little vacation in Phoenix, where, according to the lady reporter, they have been winter visitors for nearly 20 years. Noting an M.I.T. luncheon was to be held, Bob attended; Earl L. Bimson, '43, asked him in advance if he could give a talk, but this turned out to be unfeasible, for the luncheon was held in a public dining

room. However, the press insisted on a later interview, and an excellent account appeared in the March 16 issue of *The Arizona Republic*. A picture of Bob is shown and the article is headed: "AEC Member Urges A-tests Now." It reads in part: "The United States should move swiftly into nuclear testing in the atmosphere, says one of the nation's pioneer industrial scientists and current member of the Atomic Energy Commission. Dr. Wilson said nuclear weapons testing underground is slow, expensive, and fails to provide all the scientific information necessary to build the most effective weaponry for the nation's defense. We can't afford to bury our heads in the sand," he said. "We can't afford to let the Russians move ahead and ourselves not have the benefit of information which can only be obtained through testing in the atmosphere. We can't even be sure of the efficiency of our present weapons" he added. The chemical engineer, who climbed the ladder of success through research over a 41-year career, retired in 1958 as chairman of the board of Standard Oil Company (Indiana). He was named to the five-man Atomic Energy Commission in 1960 for a five-year term."

Again we have more pretty special material, much more than travelogue chattering, from Irv McDaniel—from at sea, Bay of Bengal, en route to Chittagong; from aboard the S.S. *Santhia*, at sea, en route to Penang; from at sea, en route to Yokahama; and, later, from the island of Oshima in Japan. We have pages of fascinating accounts and observations regarding Ceylon (including Kandy, Sigiriya, Anuradhapura, and Mihintale), Burma (Rangoon, Mandalay), and Thailand (Bangkok); also a few bits of information on Irv's old research project on night clubs, for example, in Penang, Singapore, and Hong Kong. The latter will be reserved for casual reading at the reunion. To Irv and Katharine, Ceylon was tops. Most tourists spend only a day there with a visit inland to Kandy, but their visit of three and one-half days was more than worth while. Irv writes: "As we entered Kandy we first came to the Botanical Gardens, and I consider this the finest tropical garden I have ever seen—far better than Singapore or Bogor (Jakarta). We drove all over the gardens and Katharine went mad with the orchids. Such flora! And we found out all about the spices and how wonderful they are. Take the nutmeg: the outside covering is cooked with sugar and makes a sweet; the inner shell makes mace; and inside is the nut, nutmeg. There is a long row of royal palms over 59 years old—we have never seen their equal. This garden alone is worth the trip to Ceylon. In Kandy we saw the temples, rickshaws like the old days in China, and were back in the betel nut chewing area."

Irv then says: "But our trip really started when we left Kandy. Again I am at a loss for words. Three days of enchantment, jungle forests teeming with wild beasts, quaint native villages, old ruins of a very ancient civilization, wild and tame elephants blocking the highway, monkeys and birds by the thousands, birds with brilliant plumage (and

we mustn't forget the thousands of mynah birds, hobbling along the road or taking their posterior position on the water-buffalo). Photogenic lakes that were really reservoirs, and all the comforts of home in the marvelous government rest-houses." First they went to Sigiriya, the capital in 500 A.D., "an enormous inaccessible fortified rock that is famous for its very old (unknown origin) frescoes. These frescoes are mostly of women and definitely one of man's earliest 'pin-ups'! I am no expert, but I assume that man's taste in women has not changed much through the ages. From there we went to Polonnaruwa—the last old capital of Ceylon. What meals! We had wild boar for dinner and papayas, mangoes, many varieties of bananas, etc. Dinner, bed, private bath, drinks, tips, breakfast came to \$1.50 per person! Each!!" The next day they left for Anuradhapura, which is "their most sacred area. The Buddhists don't have Sunday. They observe the new moons, half moons, and full moons. The full moon is the most important day of the month. At this sacred place, when there is a full moon, they have three to four million pilgrims, and there are no facilities for them. Thank goodness we missed it by a week. Should we write about this to the Peace Corps? This ancient city is over 16-square-miles of ruins—condemned for research and excavations. We saw the ruins of a bronze palace nine stories high, 1,000 rooms, and supported by 1,600 stone pillars—remarkable architecture. Then there is the sacred Bo Tree, 2,300 years old and still going strong. It was a shoot taken from the original Bo Tree, near Benares, under which Buddha got his spiritual revelations." The next day they went to Mihintale where there is "the most sacred mountain in the world. The Moslems claim this is where Adam and Eve lived. I agree that it is a Garden of Eden. Finally we had to go back to our ship in Trincomalee—one of the most beautiful bays we have ever seen. . . . We came back to the ship with one enormous 'arm' of bananas, 12 large pineapples, 24 mangoes, 12 papayas, cocoanuts, etc., etc.—total cost, \$2.00. Do you begin to get the idea that we like this place?"

As for Burma and Thailand, Irv writes: "Both places are so exotic and so different from anything we have ever seen. We were crazy about Burma but I am glad we saw Burma first as Bangkok is the tops! To me, Burma is one big pagoda, with pagoda bells tinkling in the breeze, masses of orange robed monks everywhere (and usually eating), and an impoverished people trying to maintain these pagodas, temples, and monasteries through the centuries. These pagodas are usually tall massive affairs and are covered with pure gold leaf—which has to be replaced about every five years! Shwedagon is the oldest and tallest in the world. Its gold spire is 326-feet high and the top is encrusted with over 5,000 diamonds that sparkle day and night. Rangoon is a very interesting city. What I liked best were the people in the various native garbs, a melting pot of color. We drove way up the Burma Road. The native villages are charming and the scen-

ery was magnificent. On our return to Rangoon we ran right smack into a revolution. No fooling!!" Irv gives us a special report that bears the designation: "Exclusive: Special Report from our Famous War Correspondent, Intrepid, Battle-scarred McDaniel. Special wire: Rangoon, March 3." This too, with nervous details, will be available at the reunion.

Attention! We have a poet in our midst, something some of us, at least, never suspected. But one of our scouts sent us a clipping of a four-stanza poem called "The Merry-Go-Round" that was thought to have been published in the March 4 Sunday Boston Herald, a poem by **David Longfellow Patten**. It was adapted from "Kermesse aux Etoiles: Le Grand Manège in Le Figaro Littéraire," if you are interested. Just to be sure this was the work of a '16 Longfellow, we contacted Dave and sure enough—it is! So this we will post on our reunion display board! . . . **Charlie Lawrence** reports good progress since his illness of over a year ago and has high hopes of attending the 46th. He reports that he and his wife are kept busy just with birthday and holiday events for they have 5 children and 13 grandchildren. Son Dick (3 children) is a development physicist with Minneapolis-Honeywell; son Charlie (3), a consulting sanitary engineer in Los Angeles; son Bill (5), a dentist in Indianapolis; daughter Leonice (2) is married to an Army doctor in Washington; and daughter Mary Catherine is married and teaching in Legonier, Pa. Charlie and **Jack Woods**, who is also improving, both have the 46th as a goal to aim for. We expect they'll both make it.

A neat little leaflet from the William Feather Company of Cleveland tells of a new 608-page book, really a fourth edition, entitled "Modern Refractory Practice," published by Harbison-Walker Refractories Company of Pittsburgh and "used all over the world." And there is a familiar name in what follows: "Among engineers throughout the world, Modern Refractories Practice has been known affectionately as 'MRP' for more than 40 years. In his introduction to the book, E. A. Garber, Chairman of the Board of Harbison-Walker, writes: 'As in all previous editions, W. F. Rochow and **J. Spotts McDowell** were the editors and wrote a large part of the text.' . . . Late in February, **Frank Darlington** responded to our customary please and noted that his life is "so delightfully planned and running so smoothly (subject to a few unknowns such as the impending arrival of another grandchild and an inner ear affliction which so far has brought only blank stares from M.D.'s) that there is little of interest to anyone but a member of the immediate family." he and his wife still enjoy seven months of winter in Leetsdale, Pa., and 5 months of summer at Hyannis Port. He says the summer place is remarkably little affected so far as they are concerned by the on-and-off presence of the chief executive and his retinue. Finally: "Judging by the weather reports from our restless traveling friends, Cape Cod and Leetsdale can boast the best weather in the world."

We have circulated a copy or two of Irv McDaniel's exciting accounts. **Vert Young** for example says the information on the Nile was particularly interesting to him because he and Sylvia may be able to take in the Nile on their next trip to Africa in 1963. He says, regarding Irv's story: "Few people have the knack of writing so vividly and interestingly." Because of a conflicting schedule for the trustees at Trinity College, Vert may not be able to make the reunion this year. . . . **Herb Gilkey** calls Irv's letter: "A remarkably fine letter—I have circulated it among several of my colleagues (Iowa State University), all of whom reacted as I did." . . . **Gene Barney** says: "Irv's description is very interesting. We were in Cairo a year ago but did not go to Luxor." . . . **Blythe Stason**: "A very thrilling account." . . . **The Bob Wilsons**: "Extremely interesting and colorful." . . . **Stew Rowlett**: "A masterpiece. It should be published." No doubt some 16ers have been plying their atlases looking up places Irv mentions. . . . **Paul Page Austin** tells of writing to Irv McDaniel in Thailand and having a reply. Having spent much time in Bangkok Paul writes: "Too bad Irv didn't get a chance to go to Angkor Wat. The two countries have been carrying on a feud for years. Every once in a while they break off diplomatic relations and Thai airways and Cambodian airways planes cannot fly across the border. After a few months relations are re-established and then the planes start again. This happened when I was in Thailand but when I was ready to go home relations had been re-established so I could make the trip. When relations are broken off, the only way to go is to fly from Saigon, the capital of South Vietnam or Phnom Penh, the capital of Cambodia. But that involves more travel than most tourists care to take."

Early in March, **Hovey Freeman** returned from a fascinating trip (partly business, partly pleasure) in the jungles of Surinam (Dutch Guiana). While there he inspected several plants for the Aluminum Company of America where they are mining and shipping bauxite to the United States. He and his wife "went 100 miles back into the jungle, saw the descendants of the slaves who escaped from their Dutch owners some 200 years ago and established themselves along the banks of the rivers. We came back down the river in the middle of the night in a launch and the weird jungle noises were fascinating. I have seen more nude or practically nude men, women, and children than I ever saw before in my life. What an existence! Unfortunately on the trip down, I unintentionally emulated Colonel Glenn when a very large wave hit the broadside of the ship resulting in a list of 37 degrees. I went across the cabin, hit high up on the opposite wall, landed in a heap on the couch and found later I had broken my left collar bone in two places and my scapula in one place plus a compression in one region of my backbone." He was able to continue his trip; on his return home he had to take it easy for awhile. Hovey's latest Annual Treasurer's Report (recently received)

indicates, from its list of company investments, that some of the stocks we hold are still all right.

John Gore is so interested in his hobby of the great outdoors—the birds, the flowers, the trees, etc.—that he says he just must talk about it and try to get others interested. He gave seven talks last year and as of the first of March he has given four this year. Much of his interest is being passed on to his grandchildren. He mentions three books that he considers exceptional reading, all by Edwin Way Teale: "North with the Spring," "Journey into Summer," and "Autumn Across America." A fourth book of the series by the same author will be coming out shortly.

We regret to report the death of **Leslie R. Bartlett** of Sherborn, Mass., on January 2, 1962, and of Captain **Harold E. Saunders** of Takoma Park, Md., on November 11, 1961. Captain Saunders received an S.M. in naval construction and engineering (Course XIII-A). . . . This concludes the column for the time being. As Ralph says, see you on Friday, June 8 at Chatham Bars Inn for another of our in-between reunions, this time the 46th. Don't forget, the wives are invited, and try to make it for all three days, Friday through Sunday the 10th. And continue to make the secretary's job easy and interesting by writing just a bit, but often. —**Harold F. Dodge**, Secretary, 96 Briarcliff Road, Mountain Lakes, N.J.; **Ralph A. Fletcher**, President, Box 71, West Chelmsford, Mass.

'17

This issue of The Review will reach you just as you are making final plans to be at our 45th Reunion at Snow Inn on Cape Cod. We are all looking forward to a memorable get-together.

Here is some late news concerning **George Kittredge** as reported by Willard C. Brown, '16: "Some one at our (1916's) reunion last year had told me about your 1917 classmate George Kittredge being rusticated at Barbados, so I looked him up. We had a delightful cocktail party at his home. We met some of the sugar planters of the Island at his party which resulted in our getting a look-see at the sugar industry that the ordinary tourist doesn't get. I hadn't known George at Tech, but that, of course made no difference. He has built himself a delightful house quite near to the always-warm-for-swimming Caribbean. He also has on his grounds a sort of two-unit motel—very nice it is, too—which he rents to friends. He serves breakfasts at his house just across the drive. Anybody from your class going to Barbados ought to consider stopping off with George. Renting a little car makes it easy to get about, and there are a wealth of places for good lunch and dinner. Of course, the climate on Barbados is unequalled. Both George and Marjorie seemed in the pink of good health." Willard Brown enclosed a picture of himself and George taken outside the porch of George's house immediately in front of a very colorful hibiscus bush.

George is dressed in sport clothes, wears glasses, and sports a very snappy white mustache. The photograph shows a trim athletic figure.

Two members of the Class are reported deceased: **Leslie A. Hoffman** of Trumbull, Conn., on February 21, and **Carl A. Borland** of Surfside, Calif., on March 31. Carl Borland completed the course in economics, and Leslie Hoffman was graduated in mechanical engineering. While at Tech Leslie was active in wrestling, both class and varsity, president of the Technology Christian Association, and a member of the Show Orchestra. He was an assistant engineer after graduation in the Bureau of Standards, Washington, D. C., working on the investigation, testing, and development of aeronautic instruments. He enlisted in the Air Service in December, 1917, but was never called to active duty. . . . **Hubert Wellcome** reports that his wife died on April 12, 1961, and that he had an operation for cancer from which he has recovered.

Chandler T. White, who has been acting as Washington representative for General Aniline and Film Corp. since his official retirement three years ago, has finally severed his relations with the company. He expects to continue representing companies in Washington in addition to continuing some consulting work with a few chemical companies. . . .

David E. Waite, whose official residence is at Quonochontaug, R.F.D., Bradford, R.I., decided that a winter vacation in Mt. Dora, Fla., would be a welcome change from New England winter weather. . . .

Stan Dunning and his bride of March 24, Mrs. Jeannette Roberts Dales of Washington, D.C., are spending their honeymoon touring Florida as these notes are being written. He expects to be at home at his Cambridge address about May 1. . . .

Vincent Panettiere, who has a very attractive home in Sarasota, Fla., enveigled your secretary into joining him on an all day fishing trip out of Sarasota. The boat left dock at 8.00 A.M. and returned about 5.30 P.M. from a trip to the so-called fishing grounds about 20 miles out in the Gulf of Mexico. I say so-called because out of a group of about 25 people on the boat, there were only five fish (groupers) caught. Vincent and your secretary came home empty handed. We decided to make another attempt, this time on a boat leaving at 6.00 A.M. and returning about 6.30 P.M. and going about 40 miles out in the Gulf. Although about 16 fishermen landed about eight groupers, the 1917 contingent came home with nothing more than a good windburn and a good appetite. Maybe we'll give it another try at our reunion at Cape Cod this June.—**W. I. McNeill**, Secretary, 107 Wood Pond Road, West Hartford 7, Conn.; **Stanley C. Dunning**, Assistant Secretary, 1572 Massachusetts Avenue, Cambridge 38, Mass.

what talents we have, either as trumpets of the Lord or as mere tinkling cymbals, were long since matured. Those of us who were in the Tech Show orchestra will remember how the breath swelled up in a heartfelt impulse as **Don MacArdele** blew into his trumpet, lustily and with no uncertain sound. From Littleton, Colo., comes a welcome note from him of a different sort, still cheerful as the song of the first robin which we saw in our meadow last week (early April). "It has been a long time since I took my typewriter (not my typist) on my lap to extend greetings, so let me catch up. In the spring of 1960 I was a supervisor with Temco Aircraft Corporation in Garland, Texas (just outside Dallas), and in general happy with life. My former chief at Temco had gone with the Martin Company in Denver some months before, and he finally hornswoggled me into coming up for an employment interview. I told the various people I talked with that I was not job-hunting, since I had a good job and was happy in it. I was merely putting my merchandise in a show-window with a Nieman-Marcus price tag on it, and that it was for sale at Nieman-Marcus prices. Much to my surprise, they bought it, and in August, 1960, I became a resident of Littleton, about 10 miles south of Denver and some 7 miles north of the Martin plant. Things went along placidly until last May, when I took an enforced vacation of a couple of months with a coronary thrombosis of massive dimensions. As a retired Army Officer (Reserves since 1928 and about five years in a brown suit during 1941-46), I was eligible for hospitalization at Fitzsimons General Hospital, some 25 miles from my home. That was where Ike rode out his heart attack in 1955, and be assured that he could not have received more solicitous or skillful care than I did. For 10 days the taxidermist was sitting right outside my door, complete with glass eyes, but when the Board of Directors decided that the Lord did not want me, and the Devil could not bear the thought of having me, recovery was rapid and uneventful. One of the nurses paid me the highest compliment of my advancing age by saying that when I got out of the oxygen tent she was going to put in for hazard pay. As far as I can tell, and the cardiologists say, I am now as good as I was a year ago, and better to the extent that I have taken off 20 pounds I can spare nicely. When I returned to the office, my secretary (who has been with me for 20 years) invited me to attend her 60th birthday party, and I have every intention of being present.

"My current work is connected with the paper-shuffling involved in the preparing of the Titan missile for operational use. With as complex an article as an ICBM, many hundreds of changes are necessary to develop the weapon system from its experimental stage to a condition that can, with confidence, be turned over to Air Force personnel. The task of recording these changes in the hundreds of components of the system, and of keeping records so that we can tell in seconds that Serial Number 9 of Control Console Number 2010 is at present at the South Lockwasher Air Base, and that all

changes through No. 22 have been made, is a chore that would be deadly if it were not for the fact that procedures can constantly be simplified and made more workable. That is what is on my shoulders. Diddling around with instructions to move wire 72 from plug 108 to plug 49 keeps me busy between 8:12 and 4:42.

"Before and after those hours, though (usually starting about 4 A.M.), I continue the Beethoven research that has occupied me since 1945. You will recall that in 1957 I published a collection of Beethoven letters, and I am currently wrangling with publishers for two other books that I could get out of the way in a year or so. My principal work in this field, though, is based on the fact that a great man is surrounded by lesser men who had influence of varying degrees on his life history, and the further fact that the true account of the great man cannot be given without some knowledge of these bit players and walk-ons. Specifically, the names of some 4,000 persons crop up in the Beethoven literature. Most of these men were highly unimportant in determining the course of Beethoven's life (e.g., Johannes Dumkopf, whose sole appearance was at the time he played the clarinet in a performance of the Beethoven Septet), but a few hundred of the 4,000 really had an influence. Herr Dumkopf might rate 20 words in my encyclopedia, but I have just sent off to a German journal an article of some 9,000 words on the man who for the last 20 years of Beethoven's life was his principal patron and supporter. Research like this is, for the most part, like trying to fill a salt cellar one grain at a time. It just happens that I get a real sense of accomplishment out of it, and can look forward to a foundation grant that about 1966 will take me to Germany and Austria for a year or so to put the finishing touches on the magnum opus. That, at any rate, is what I am aiming for, and Ruth will bring a microfilm camera along to record some 20-30,000 pages of material on Mr. Beethoven that cannot be found in this country. Meanwhile, we are living a good life among congenial people in a country of breath-taking beauty. The two daughters, both now in the San Francisco Bay Area, have produced half a dozen grandchildren. Income is greater than outgo; both of us are busy and happy. What more is needed?" Thank you, Don, for such a complete and lucid account of your doings.

John R. Poteat has also sung the song of spring, playing it andante allegro without arpeggios. "Reading the Class News in the March issue of The Technology Review, I observe the lengthening list of names of our classmates who have died. Among them this time is **Ted Winslow** who was one of many we used to see frequently when we lived in Cleveland, Ohio. His widow, who with Ted, was and still is a most engaging practical joker, was our guest in January for two weeks. The project on which Ted was at work at the time of his death was a patented kite which was without a tail and had an amazing stability in all kinds of weather. Before his death he turned over to a paraplegic all his designs and materials so that war torn man can make a living. Our

winter has been quite mild with only a little snow now and then to remind us it was winter. Our spring is well along with much bloom and balmy days. Last year Betty and I missed the beauty of a Tryon spring in favor of a four-month European trip, during which we cruised through the Greek islands and went as far east as Lebanon. We are now getting much more out of "The King Must Die" since we have visited the Palace of Minos at Knossos on the Island of Crete. Two weeks of driving through southwestern England in beautiful weather the first two weeks of June topped off the trip except for the cataloguing of the thousands of pictures I took. This year we are going to see the United States and take the inland waterway cruise to Alaska. We expect to visit the Seattle World's Fair en route. As you gradually dig out from under the deep mantle of snow that covers you it may help your patience as you wait for the New Hampshire spring, to know that at least one of your classmates is already enjoying what you are waiting for and which will reach you as it creeps north. No more typing now; I must get out for a round of golf."

Surely a good class secretary acknowledges the receipt of communications from the brethren with a letter of his own, thus giving added richness and conviction to the relationship. What makes Poteat unique is his responding in exhilaration with a second letter as follows: "Your reply to my recent missive calls for some kind of a response. One element of that response is surprise that black flies and mosquitoes are still inhabiting the earth. I would think that the seclusion which you enjoy would give freedom from such creations. Confidentially—while we don't have those two pests, we do have what we call 'no-seeums,' a tiny black gnat that can come through the screens and feast on the succulent blood of the retired natives of Tryon. And three or four times a year we will find a small scorpion in the house; where they come from or how they get in is a mystery. Your comment suggesting that we take in the Grand Tetons tunes in on our plans, for after we drive through Yellowstone—and I have an idea it will be no more than that—we will proceed to the Grand Tetons for a visit. And while both my wife and I have been to Yosemite, the couple who are going to drive with us have not been. It is our plan to go there too. Of course, we will see the Mariposa Grove which, to me, is more exciting than Yosemite itself. Those trees are living things that have stood for centuries, but the stone of Yosemite is cold and inorganic residue from the earth's upheavals and glacial scouring. So as long as we are in good health and can manage to scrape up the cash we are going to see as much of the world as these two limitations will let us. In the meantime, spring is creeping toward New Hampshire and you can sit by your fire, or stand and toast your fanny with the assurance that when it arrives it will be beautiful and worth waiting for."

The trumpet of **Bill Wills** is by no means muted because he is no more. The good men do lives after them. Because the

Boston Architectural Center was close to Bill's heart, his professional associates have set up a memorial fund to be used for the benefit of students at the Center. It occurs to these members of Bill's organization that his classmates would like to know about this, for some may wish to contribute by sending a check to 320 Newbury Street, Boston, payable to the Boston Architectural Center. Note on the check that it is for the Royal Barry Wills Memorial Fund. . . . **Louis F. Woodruff**'s trumpet is now also forever muted. He was buried on February 27 in Columbus, Ga. For 22 years he lived in Wellesley Hills, but was recently in Washington where he served as chief scientific consultant to the director of Army Intelligence. During World War II he went overseas. Woodruff wrote "Electrical Power Transmission" and invented a machine used in the Nielson rating process which gauges the number of people watching a television program. He is survived by three daughters and five grandchildren.—**F. Alexander Magoun**, Secretary, Jaffrey Center, N.H.

'20

Ray Reese was elected president of the American Concrete Institute at its 58th annual convention, in Denver recently. Ray's consulting engineering firm, Raymond C. Reese Associates, is headquartered in Toledo. He has represented the A.C.I. at important concrete conferences in Europe during the past few years, visiting industrial plants, construction projects and consultants in England, Denmark, Sweden, Norway, Germany, Austria, Italy and France and has worked closely with the Comité Européen du Beton, an international engineers group for better co-ordination of information on concrete. There was a picture of Ray in the Berkshire Eagle of Pittsfield, Mass., and he still looks very dynamic. . . . **Frank Hunt** thoughtfully forwarded a feature story on **Morris N. Lipp** that appeared in the Miami Sunday Herald early this spring. Morris, as many of you know, is one of the best known and deservedly popular individuals in Miami Beach, where he was city engineer for many years and later city manager. The newspaper feature writer refers to Morris as "a soft-spoken, rotund bundle of energy who will hang up two official hats and walk from Miami Beach City Hall on May 5 after 36 years of public service. Had there been enough hours in the day, he might also have been city attorney as he has a law degree, too. With his last look from his office window he will see a city he helped guide and plan from a hodgepodge of 1926 dreams to present day magnificence. He will see miles of white sand beach saved from erosion by protection systems of his own design, which other cities have copied. He will see the great Convention Hall and Auditorium, broad pavements, traffic brought into some semblance of order. Not that he takes full credit for all this. He will only say, 'It looked like the practical thing to do, so we did it.'"

Morris' first job was with the Illinois Highway Department and from there he got into road building with a Miami Beach contractor but soon joined the city engineering staff. Says Morris, "the city offered a wonderful series of challenges. Preconceived engineering ideas had to be turned all around. There were unique sewage system problems in a city so low and flat you couldn't dig deep trenches. There was the beach erosion problem. (He is a director of the American Shore and Beach Erosion Society, which has published many of his papers on combating erosion. During the war he joined the U.S. Army Engineers and built airfields and camps all over the country before ending up as a major on General MacArthur's staff in Tokyo. As soon as the war was over he went back to his work at Miami Beach. He and his wife, Helen, live at 859 47th Street.

Professor Emeritus **C. Richard Soderberg**, formerly Dean of Engineering at M.I.T., gave a paper on "The Trends in Engineering Education: Do They Concern the Power Industry" at a recent symposium of the American Power Conference in Chicago. . . . **Foster B. Doane**, Vice-president of Bergstrom Paper Company, Neenah, Wis., was author of an excellent article on certain phases of papermaking in a recent issue of Paper Trade Journal. . . . Captain **Sidney E. Dudley** died on March 23. His home was in Worcester, Mass. . . . Noted also with deep regret was the death of **Larry Boyden** last winter in Punta Gorda, Fla. Larry had been in poor health for some years. He was a prominent and highly popular member of the class, and his loss will be keenly felt by his classmates.—**Harold Bugbee**, Secretary, 21 Everell Road, Winchester, Mass.

'21

Alumni Day on campus in Cambridge on June 11, 1962, is just around the corner as you read these notes, and we sincerely hope you and your wife are making every effort to be there. We can only repeat what has been said many times—if you have never attended these most enjoyable one-day gatherings of the clan, please start now. If you are one of the regulars, just don't stop! Even at this date, you can phone, wire or write to the Alumni Association Office at M.I.T. for tickets for any or all of the day's events. The official schedule covers morning tours of existing facilities and those exciting new ones under construction, after we go to Rogers lobby for registration. Noon luncheon in the Great Court is a time for 1921 to congregate and hear our revered Jay Stratton, '23, recount the year's milestones and tell of forthcoming accomplishments. The afternoon symposium, demonstrating new teaching concepts and techniques, will itself demonstrate Technology's outstanding ability to present the full treatment in a remarkably concise and interesting manner. For relaxation, there's the cocktail hour with all the classes on Briggs Field, followed by dinner in Rockwell Cage with 1921

seated together. No speeches, of course, but there will be entertainment. Please be there!

David O. Woodbury, whose 17th full-size book, "The Ice Age," is being readied for publication, is a most faithful and welcome contributor to these class notes. Writing from his home in Scottsdale, Ariz., Dave says: "Since you have straightened out the good brethren who read your columns in The Review as to my correct Arizona address, I can do no less than to take the hint and contribute my annual advertisement to your classified department. I have just got back from a long trip through the ice ages of the Pleistocene, with the help of a time gimmick which hastens things up in the ratio of 100,000 to 1. Having scrambled up and down over the great glacier for a period of 18 months, I'm back in home port again with the book completed, and gratefully toasting my hands before the home fires. It was a long pull and, while not exactly a new frontier, it did furnish novel experiences, to say the least. If I can get by the various geologists and paleoclimatologists who must read the thing for errors, it should be published this year. It is by far my furthest north in making palatable reading of indigestible scientific fact. I look back on the days I spent in a Boston hospital while the rest of you were re-landing on Plymouth Rock last June with deep regret. But had I been there I would have suffered the disadvantage of not being able to talk to anyone. Orders from the doc who removed a polyp from my vocal cords were not to speak above a whisper for 10 days. The day I got back home with these burdensome orders, the phone rang and my wife answered to find a Boston lawyer, a stranger, who wanted to buy my one patent on a projection machine. The questions got very technical, and we utterly confused the lawyer when I had to coach India in whispers and have her relay the information. Somehow I whispered my way into a sale. Thus I think I have gone full circle in creative science. Forty years ago, I worked my way out of M.I.T., like a man squirming out of a manhole, by inventing a harmonic analyzer. Now I have wriggled back into, shall we say desuetude, by means of another invention.

"I've done a bit of work for various magazines this year, including a Reader's Digest offering and a bit of humor for Down East Magazine. My last book, 'Outward Bound for Space,' was blasted off by Atlantic Monthly Publishing Company a year ago and is still in shaky orbit. Not many people are tracking it, and I find myself nodding at the controls. Anyway, it's still up there and telemeters down a small greeting twice a year. Actually, I still have eight books in print here with a few in foreign countries besides. Why people still buy my book about Vanguard, I don't know, but they do. Or the one about Palomar, written 23 years ago. With the ice age offering, I guess I qualify as the one in the class the furthest behind. I hope that is a distinction. India and I are trying to sell our holdings here in the West and trek back to Ogunquit, Maine, where we have begun building a

winter house right back of the present summer one. We tell people that it's smarter to move 300 feet, come fall, than 3,000 miles. So, if you will please turn up the furnace a little, I will climb in for a long winter's nap." A later note from Dave says that they have again come East to their home on Shore Road in Ogunquit; we hope they will be in Cambridge come June 11.

Arthur E. Raymond, retired senior Vice-president for engineering of Douglas Aircraft Company, has been appointed a special consultant to James E. Webb, head of the National Aeronautics and Space Administration. . . . **Webster W. Frymoyer**, formerly Vice-president of manufacturing and engineering of the Foxboro Company, Foxboro, Mass., has been elected executive vice-president of the company. . . . **Dana C. Huntington**, President of Dennison Manufacturing Company, presided at the recent annual meeting held in Framingham, Mass., where the company's principal manufacturing facilities are located. . . . **Henri P. Junod** is one of two Institute Alumni recently named as vice-presidents of the Community Chest of Cleveland, Ohio. Known for his participation in local civic activities, Harry is a partner in the Pickands Mather Company and a director of fuel and dock companies in northern Ohio. He has been closely associated with the Community Chest since 1943 and has been a trustee since 1959.

Robert F. Miller, our class photo historian, writes from his home in Falls Church, Va.: "I am sending you 90 color slides of our 40th Reunion to be added to those you have received from others in the class. I have made copies of several of them, including one of the Valdés family, which I have sent to Viviano. I had been holding the pictures here on the chance that someone of the class would be visiting down this way. In February, we were favored by a visit from **Ray and Helen St. Laurent**, who enjoyed seeing them in a showing at my home. According to present plans, our youngest daughter, who is a junior in high school, will finish her school year on June 8. This works out perfectly and should permit us to drive to Taunton and be on hand for Alumni Day." Bob has made another superb collection of photographically perfect pictures of 1921 families in action and relaxation at the Plymouth reunion and at last Alumni Day. You are probably in one or more of them. If you haven't sent in the still pictures or movies which you took, we'll welcome their addition to the class collection. . . .

Harry M. Ramsay, former President of the Wholesale Tire and Supply Company of Minneapolis, Minn., writes that he has retired. He is now a neighbor of Dave and India Woodbury in Scottsdale, Ariz., where he lives at 6700 East Thomas Road. . . . **Carl A. Hasslacher** says his home address is Chateau Rochambeau, Scarsdale, N.Y. . . . **William F. Kennedy** has reported a new home address in care of Mr. Greery, Box 447, Princeton, N.J. (Watts Humphrey, please note.) Our fellow townsman, Pat Hogan, says Bill retired from Bethlehem Steel's New York City offices earlier this year and that

he and Mrs. Kennedy planned to go to Tucson, Ariz., and then spend some time with their daughter on the West Coast. Pat adds he is disappointed not to have heard from Bill and promises to share with the class any communication that may result from this public pronouncement.

President Kennedy has appointed Dr. **Augustus B. Kinzel** as one of 12 scientists and educators forming the committee which will name winners of the new National Medal of Science to be awarded to those making important contributions to physics, mathematics, biology and engineering. Gus is also in the news for delivering an address to the Symposium on Molecular Architecture, held in Oklahoma City, Okla., during April under the auspices of the Frontiers of Science Foundation of Oklahoma, Inc., in conjunction with the American Chemical Society. . . . You have received the letter from Class President Ray St. Laurent reviewing the past year's activities of the Class of 1921 and going into some detail regarding our 40-year gift and a summary of the last five years. We, too, want to thank you for your support of 1921 giving, as well as the help you have provided in completing questionnaires and otherwise furnishing news of yourself in order to maintain this column of Class News. . . . Two letters have been received from Class Agent **Ed Farrand**. Ed says he is back in harness after a period of illness early this year and enjoying the beautiful Georgia spring weather as early as the latter part of March. Ed and **Larc Randall** are most prolific letter writers to all members of the class in behalf of our annual giving. The summary in Ray's letter reflects the excellence of their friendly notes and your ready and substantial response.

Welcome to a voice we haven't heard for too long a time. Writing from his home at 609 Palmer Road, Yonkers, N.Y., **Alfred J. Shaughnessy**, Vice-president and General Manager of Hertz System, Inc., says: "It certainly was a pleasure to receive your letter with the warm invitation to attend the Alumni Day activities in Cambridge. Perhaps I should explain that having been located in the Middle West for so many years and so far removed from Boston, I have been almost entirely out of touch with classmates and M.I.T. activities. Your suggestion about getting together in June sounds intriguing, and I am going to make a real effort to do just that, thanks to your thoughtfulness in writing me as you did. I am not going to attempt a biographical sketch now, except to tell you that we have three daughters and nine grandchildren, with two more expected this year. I expect to retire at the end of this year and with that in mind, have purchased a home at Delray Beach, Fla., for our winters. I have a cottage in northern Wisconsin where we have been spending our summers for a number of years and expect to continue. I am going to look forward with a great deal of pleasure to seeing you and other classmates in June. It should be a delightful experience to renew friendships after such a long interval." We're looking forward to it, Al.

Received too late for publication last month was a letter from **Alexander E. Halberstadt, Jr.**, '46, of the Pacific Building Corporation, 1570 Akron-Peninsula Road, Akron 13, Ohio. Regarding the death of his father, reported in our notes for May, he writes that other surviving members of the family include his mother, who lives in Bradford, Pa., and a sister, Mrs. Warren W. Currier, who is currently in Tanga, Tanganyika, where her husband is teaching high school science.

Through the courtesy of Alvin Guttag of Washington, D.C., Secretary of the Class of 1940, we have additional biographical data on the late **Thomas F. Murphy**, Supervising Examiner of Patents, whose passing was reported in the February Class News. The February issue of the Journal of the Patent Office Society says, in part: "He was born on April 4, 1896, in North Andover, Mass., and received his early education in that area. He entered the Patent Office in 1931. It did not take him long to become a popular member of the examining corps because of his exuberant personality and strong interest in the human side. He was particularly active in matters affecting the personnel. He was elected president of the Patent Office Society and was an organizer and past president of Patent Office Lodge 650, A.F.G.E. He served on many important Patent Office committees and for years was chairman of the Incentive Awards Committee. He received the Department of Commerce Silver Medal Award for meritorious service." . . . A phone call from Ray St. Laurent just before our April closing date for this issue, told of a business and pleasure trip to the West Coast that he and Helen are planning for early in May. They anticipated an extended visit to the Seattle Fair, to be followed by a trip to Canada and Alaska.

With profound sorrow, we record the passing of two of our members and extend the sincerest sympathy of the Class to their families. **Henry Seymour Colton** of 30 Wellesley Road, Swarthmore, Pa., President of the Macco Chemical Company, died on March 12, 1962. He had been ill since Christmas and had gone to Jamaica to recuperate but was hospitalized after his return. Born in Calumet, Mich., on February 24, 1901, he prepared for the Institute at Berkshire School and was graduated in Course IX-B. At Technology, Babe was a popular member of the swimming team, specializing in the 40-yard dash and the varsity relay team. He was also a member of Sigma Chi and active in the Chemical Engineering Society and on the tennis team. He had been assistant technical director of DuPont in Wilmington before going to Cleveland as chief of the industrial chemical division of Grasselli Chemical Company, a DuPont subsidiary. He then set up his own consulting engineering offices in Cleveland and later was named president of Cosma Laboratories, Inc., of Cleveland. In 1943, he founded and became president of the Special Chemicals Company, which was renamed the Colton Chemical Company and subsequently purchased by Air Reduction Company. He founded the Macco Chemical Company of Cleveland, which acquired the Gates Engineering Company and the Delaware Valley Steel Company of Wilmington. He was a director of Macco, Gates and the Woodrow-Dare Company. His memberships included the American Institute of Chemical Engineers, American Chemical Society, American Association for the Advancement of Science, University Club and the Cleveland Skating Club. He is survived by his wife, the former Ruth Watters of Philadelphia; two sons, Gary S., '49, of Shaker Heights, Ohio, and Evan T., '55, of Lynnfield Center, Mass.; two daughters, Mrs. Jonathan Bushnell of Glen Ellyn, Ill., a Swarthmore graduate, and Mrs. Richard Inglis, 3d, of Durham, N.C., who attended Mt. Holyoke; his mother, Mrs. Gary N. Caulkins of Scarsdale, N.Y.; two brothers and nine grandchildren. We wish to thank Mrs. Colton for her kind aid in preparing these notes.

Robert Reese Neyland, Jr., of Knoxville, Tenn., a retired brigadier general and athletic director of the University of Tennessee, who was nationally famous as the coach of the Vols football empire for 27 years, died on March 28, 1962. Born in Greenville, Texas, on February 17, 1892, he attended Texas A. & M. for a year before entering West Point. At the Military Academy, he tied for the gold sabre awarded to the best athlete in the senior class, based on his sensational baseball, boxing and football. He served in France in World War I and entered Technology on his return, obtaining his bachelor's degree with us in Course I. He returned to West Point as aide to the then superintendent, General Douglas MacArthur, and coached football and baseball before going to the University of Tennessee as R.O.T.C. instructor in 1925. He became head football coach the next year and started building the many teams that won him fame and also training upwards of 200 men who later became well-known as coaches. Illness in 1952 forced his retirement from active coaching and he continued in his lifetime post as athletic director. During World War II, he returned to active duty as a major and retired as a brigadier general. Part of this period, he was division engineer in Dallas in charge of all military construction in five states. Overseas, he commanded all supply forces in the China-Burma-India theater. He won the Distinguished Service Medal, the Legion of Merit with cluster, the rank of Officer in the Order of the British Empire and the Chinese Order of Cloud and Banner. At the time of his death, he was chairman of the football rules committee of the National Collegiate Athletic Association. He is still considered to have been one of the greatest athletes in West Point history and has been regarded by many as the top coach of modern football. Ripley once described him as the most remarkable athlete since Jim Thorpe. He is survived by his wife, the former Ada Fitch of Grand Rapids, Mich., and two sons, Robert R., 3d, and Lewis.

Join us on Alumni Day. Last year, Ray St. Laurent had the honor of announcing our tremendous 40th Reunion gift in the form of the largest amount ever given to

M.I.T. by any class. Your further contributions to the Amity Fund and the Second Century Fund during these succeeding 12 months are being added to swell the Class Gift and you'll certainly want to hear in person the final grand total. See you next week.—**Carole A. Clarke**, Secretary, c/o International Electric Corporation, Route 17 and Garden State Parkway, Paramus, N. J.; **Edwin T. Steffian**, Assistant Secretary, c/o Edwin T. Steffian and Associates, 376 Boylston Street, Boston 16, Mass.

'22

The week of our 40th Reunion is practically here with every thrill packed minute well planned from Thursday evening through Sunday dinner at the New Ocean House, Swampscott, then to the dorms adjacent to the president's house as guests of Tech for Sunday night and all day Monday. The heated salt water pool, the golf course and other facilities sound most attractive. The tours to colonial Salem, historic North Shore places, the art studios at Rockport and antiques at Marblehead will keep your wives busy while the boys are having their five-year visit. Remember to bring your red shirt and gray flannel slacks as the costume of the day. Severely diet for the previous week to make room for the special dinners and late evening snacks. If you haven't planned it before you read this, just drop everything and please come. Remember that you will be with the finest class of M.I.T. . . . Your secretary has now returned from the Mediterranean and thanks **George Dandrow** for the class notes of April and May. A much higher plane of editorial comment has been noticed during the interval. . . .

Samuel M. Seegal, Executive Vice-president of Filene's, plans to retire in June after completing 38 years with the company. He will continue as a director but will devote much of his time to his many interests in the area of public service, including a visit to Moscow this summer as a member of the American Cancer Society. . . . **Dawson Powell** of Warwick, R.I., has established a new way of preventing and extinguishing fire by inhibiting or breaking chain reactions which occur in the reaction zone of flame. The scope of usefulness of the new method has been demonstrated to cover almost all ordinary combustibles and is expected to have usefulness in preventing or extinguishing fires in high energy fuels and solid fuels for rockets. Powell is the author of "The Mechanics of Fire," first published in 1955.

Another feature of the reunion will be to hear **Fred Dillon** tell of his seven-week trip to Florida, Jamaica, the Virgin Islands and Puerto Rico during the winter. He also visited **Frank Kurtz** at Del Ray Beach. Frank will be with us to tell that story and many others. **Dale Spoor** and his wife dropped in at the same time and they will have a different version. **Duncan Linsley** will join us to tell of his 'Mauretania' cruise through the Mediterranean and especially of his small

boat trip at Catania. . . . And now to write a check for **Everett Vilett** for the reunion while wearing a fez from Cairo, sitting on a hassock from Jordan and smoking a pipe from Tangier.—**Whitworth Ferguson**, Secretary, 333 Ellicott Street, Buffalo 3, N.Y.; **C. George Dandrow**, Assistant Secretary, Johns-Manville Corporation, 22 East 40th Street, New York 16, N.Y.

'23

Just a few more words about our friend, **Rod Goetchius** who has been interviewed on television on several occasions in connection with the orbiting of Astronaut John H. Glenn, Jr. Rod was in charge of building the tracking stations around the world. Rod came originally from Abington, Mass.; he was graduated in 1918 from the high school before joining our class at M.I.T. He is now a resident of Wisconsin. . . . **Richard E. Randall** was recently promoted to the position of national sales manager of the Contract Bond Department by the American Casualty Company. He started his insurance career as a loss prevention engineer and has subsequently held concurrent responsibilities for underwriting, production and engineering in the contract bond field. . . . **Phil Coleman**, President of the Western Society of Engineers and Vice-president of Duff and Phelps, Inc., Chicago, was chairman of the joint luncheon of the APC and WSE at the American Power Conference held at the Sherman House, Chicago in March. . . . **Martin L. Tressel**'s good work for the United States Lawn Tennis Association for many years resulted in his election to the post of second vice-president of that organization for the year 1962. Martin is with the Aluminum Company in Pittsburgh and is a fine tennis player, even after all these years away from M.I.T.

We regret to announce the deaths of three more of our classmates and wish to extend sympathy to their families. Professor **Lyman M. Dawes**, retired member of the electrical engineering faculty at the Institute, died on March 6. Professor Dawes retired in 1947 and had been a resident of Belmont for 30 years. He joined the staff of the Institute in 1922 while still a student. . . . **Bernard S. Falk**, sales manager of the Ilco Division and export manager of the Independent Lock Company in Fitchburg, Mass., died on March 20 at the age of 59. Bernard joined the Independent Lock Company in 1927 and served on the board of directors of many years. He was a member of the Agudas Achim Synagogue, Leominster. He also was a member and past-president of both the Achodus Lodge, B'nai B'rith of Fitchburg and Leominster, as well as the Fitchburg-Leominster Jewish Community Center. He served as a former director of the Fitchburg Chamber of Commerce, director of the Leominster Red Cross and was a member of the International Trade Association of New England and a member of the budget committee of the United Fund in Fitchburg. . . . Major General **John K.**

Christmas died on March 9, of a heart attack, in Plymouth, Mass. Major General Christmas was one of America's top tank experts in the years before and during World War II. He was 67 years old; he was born in Pittsburgh, Pa., and graduated from Lafayette College in 1917. In World War I he fought with the 60th Artillery in the St. Mihiel and Argonne offensives.

We wish to announce the following address changes: **Arthur W. Davenport**, 109 Bay Drive, Linkhorn Park, Virginia Beach, Va.; **Pierre F. de Reynier**, 614 Kipling Street, Houston 6, Texas; **William B. Gurney**, Gulf States Utilities, P.O. Box 2951, Beaumont, Texas; **Roger E. Valentine**, Tsumeb Corporation, Ltd., Tsumeb, South West Africa.—**Herbert L. Hayden**, Secretary, E. I. du Pont de Nemours and Company, Leominster, Mass.; **Albert S. Redway**, Assistant Secretary, 47 Deepwood Drive, Hamden 17, Conn.

'24

One of the unhappy features of being class secretary is the frequent necessity for being the bearer of ill tidings. The death of **Warren Hill** on April 2 takes precedence over everything else this month. Warren had a varied and brilliant business career. A chemical engineer, he worked for two lime companies before joining Pro-phy-lac-tic Brush Company in 1930. He became a vice-president of this company, then left to accept the posts of vice-president and general manager of the Shellmar Products Corporation in Ohio. From there he moved back to New England as executive vice-president and director of the Plax Corporation in Hartford. From 1955 to 1959 he was president of the Thermod Company, and in 1960 he founded his own business, Warren E. Hill Associates, Inc., business counselors in New York. Although your secretary has not been told the cause of Warren's death, it was after a short illness, and the last line of the obituary gives an unmistakable clue: "It is requested that, in lieu of flowers, contributions be made to the National Heart Fund." To all of Warren's family goes the deep sympathy of the class.

Dick Lassiter, following the **Henninger** precept, spent a couple of months this winter in Florida. Dick did not spend much time basking on the sands though. He was working on an automated crushed stone plant for Maule Industries, one of **Luis Ferre's** and **Al Roig's** outfits. However, says Dick, while it was no vacation it did make the New York winter quite short. . . . After many years with Bemis Bag on the West Coast, most recently as manager of production, **Elwood M. Proctor** returned to the home plant in St. Louis a year ago. He was director of production until this February when he was upped to vice-president. . . . The **Charles R. MacBraynes** of Chicago announce the marriage of their son, C. R. Jr., to Lillian Diana Magnusson on May 5. . . . After the terrific storms in early March, **Paul J. Cardinal** went down to Bay Head to see how his summer

home stood up. There was no damage to the house, but the beach had disappeared "and it looks like the drop in property valuation will range between \$10,000 and \$15,000."

"When I read of the trips and travels of my good classmates, I join them in their pleasure, and since I have not had the same privilege, I have had to send an ambassador," says **Pret Littlefield**. The ambassador, his son Peter, is an ensign on the flagship of the Middle East Task Force based in Bahrain, and he's certainly doing enough traveling for the whole family. In addition to such ports-of-call as Malta, Venice, Cairo and Aden he has been able to make little side trips to Mount Kilimanjaro, the Kenya game preserve, and the Taj Mahal. When his ship stopped in Barcelona, **Mike Amezaga** was on the dock to greet him and extend his justly famous hospitality. Mike was about to leave for Genoa on business. We discovered, also, why Pret moved away from Darien. He and Peg have built a new house in Norwalk in an intriguing sounding location on Five Mile River and Millard Pond. "We have been in the new house about two months and it is 96 7/10 per cent finished. As usual, the M.I.T. steins have a prominent location over the bar."

The Phi Gamma Delta magazine for March has a lengthy feature story on **Hoyt C. Hottel**—"Hottel Famed for Hot Tips." It is all about his work as one of the world's leading authorities on flame, fire, combustion, conflagration, and heat. Hoyt got his master's in chemical engineering with us, is now professor of fuel engineering at M.I.T. The article goes on to describe his many honors and accomplishments, but one little item really stood out. At Indiana, where he did his undergraduate work, Hoyt was elected to Phi Beta Kappa at the age of 17. . . . **Leon G. Rucquois** got his master's degree with us also, in civil engineering. He returned to Belgium and was in the Belgian Air Corps during World War II. Coming back to this country after the war, he was a consulting engineer in New York until last fall when he moved to Florida. In March he died. A further death to report is that of **Charles K. Lawrence** of Brooklyn. He was with us for a year after graduating from Harvard, then went on to get his Ph.D. . . . Guess that about does it for now. Alumni Day is June 11. Hope to see many of you there.—**Henry B. Kane**, Secretary, M.I.T., Room 1-272, Cambridge 39, Mass.

'25

It is my sad duty to note the passing of two classmates whose deaths have been reported during the past month. **William F. Rice, Jr.**, of East Orange, N.J., died on June 22, 1961, but word of his death only recently reached the Alumni Association through his widow. Lobby has passed word along of the death on March 31, 1962, of **Jose A. Arena** in Mexico City. . . . Two classmates have been around the Institute during the past month. **Bob Read** was here on business but due to

other commitments I was unable to see him; but I was able to enjoy having lunch with **Fred Cunningham** and his wife, and followed that with a most interesting hour with Fred. He has a son who is a junior at M.I.T. and his presence here brought Fred and his wife on to Cambridge for the day. Fred was associated with the Arma Corporation up to about a year and a half ago when he set up his own business in Stamford, Conn., where he deals in non-circular gears through his company which is known as Cunningham Industries, Inc. I am sure Fred would be only too pleased to show any of you what he is doing in this field if you happen to be in the neighborhood of Stamford.

A nice letter from **Tom Killian** brings me up to date on his present activities. I believe most of you knew that he had been made a rear admiral in the Naval Reserve about a year ago; and, more recently, he left the Office of Naval Research, where for a matter of six years he had been deputy chief and chief scientist. As of the first of April, he went to Seattle University, Seattle, Wash., as assistant to the president in science and engineering. Any of you who are visiting the World's Fair in Seattle this year should get in touch with Tom at the University. . . . There are other notes of more-than-passing interest. An announcement from the vice-president, manufacturing of Anaconda American Brass Company informed us that **P. J. Morell**, who since 1943 has been works manager of the company's Small Tube Division in Waterbury, Conn., has been made plant manager of that division. Pat started with the Anaconda Zinc Department at Great Falls, Mont., shortly after graduation and has been connected with the Anaconda organization since that date.

Edward H. deConingh, Partner and Chief Engineer at Mueller Electric Company in Cleveland and widely known in that area for participation in local civil affairs, has been appointed campaign chairman for the United Appeal of Greater Cleveland for another year. In 1961, Ed as campaign chairman was instrumental in carrying their campaign over their goal which exceeded more than \$12,000,000. . . . **Sam Glaser** can be added to the list of classmates traveling far and near, since he has recently returned from a trip to Europe.—**F. L. Foster**, Secretary, Room 5-105, M.I.T., Cambridge 39, Mass.

'26

A dog story seems to again be the order of the day and your secretary is the dog—not that this is anything new. But now I have a leather collar and dog tag. Remember last month I mentioned writing the notes at arm's length with a towel spirally wound around my neck to render it immobile and take the pressure off a pinched nerve? The contraption seemed to help so they built a collar for me and I stole Heidi's dog tag and had it riveted to the side of the collar. The tag is inconspicuous but every now and then in a crowded elevator I hear someone in

back of me start to giggle. Ted Williams had the same difficulty a few years ago, and I remember the way they babied him; but me—I get the veterinarian treatment: put on the dog collar and come around and see me next month." So feeling the need of a spring tonic and having had three Volkswagens, it seemed like a good idea to buy a new car. The most Volkswagenish car I was able to find was a Swedish Volvo which is slightly larger and 600 pounds heavier and has three times the power plus a body design exactly like the 1939 Ford. The craftsmanship equals or surpasses the Volkswagen. So for my spring tonic I've ordered one in bright red.

But let's get going on the notes and let's get the distressing news off first. Two deaths have been reported with no details. Clippings may arrive later. Professor **Paul V. Jewell** of Greensboro, N.C., and **Francis V. Zendzian** of Buell Engineering Company, New York City are reported deceased. Our sincere sympathy is extended from the class to their families. . . . A recent letter from **Eliot Bidwell** contains the following: "I recently came across the enclosed shots taken at our 25th reunion at Groton, Conn. I know of no better place for them than your own accumulation of class pictures. One of the best is of our genial Class President, **Dave Shepard**, and **Jerry Doolittle**, whose death was reported in your January Class News. I was genuinely shocked to hear of Jerry's going since he seemed so well last June. I read in your April notes that you saw **George Edmonds** in Wilmington through a revolving door—or was it a swinging door, or were you both revolving? At any rate if you run into him again through any door, give him my best regards. You can see from the above that you have at least one loyal reader, and if you ever accumulate enough material to write a book I might even buy one." . . . Our genial class president referred to by Eliot sent me a report on the Power Authority of the State of New York calling to my attention that **Bill Latham** is listed as resident engineer, Niagara Project. Quoting from Dave Shepard's letter: "I don't know whether Bill sent me this report or whether it was Mr. Robert Moses. In either case, I have looked at it with interest and decided to send it along to you. I suspect that it was Mr. Moses who sent it to me because he sends me periodically such materials when he sends them also to other members of the Board of Directors of the New York World's Fair 1964-1965. Maybe Bill would be willing to give you some additional information on his activities. I should think it would be very interesting."

About once a year, usually after a little needling, **R. Gordon Spear** writes us a letter on some Detroit class news items. This time it is a letter from which we quote: "Dear George, I had intended writing you but when you mentioned it in your last notes it really jarred me into action. To me, our last reunion was the best yet, and it was certainly a pleasure to spend a couple of days with you and the other members of our class. You may

recall back in 1953 the spectacular and disastrous fire at the General Motors Transmission Plant in Livonia just outside of Detroit. That plant was supposedly the last word in a fireproof building, but a careless use of a burning torch ignited cutting oils and the plant was almost completely destroyed. In 1954 Fisher Body Division took over the site and rebuilt a modern plant for production of interior soft trim for Pontiac, Oldsmobile and Buick automobiles. It was my good fortune to become manager of this plant in January, 1959, and just last year we completed a new material facility increasing our total floor space to approximately 1,200,000 square feet. In June of last year we completed installation of a Guide-O-Matic System of moving material throughout the major portion of the plant. This system consists of an electronically controlled driverless tractor which pulls loads of up to 30,000 pounds by following wires embedded in the plant floor. These tractors can be programmed to go between any established stops in the plant without drivers. Of course, there are safety devices to protect pedestrian traffic. The system installed in this plant is by far the most comprehensive one ever put in by the manufacturer, and our total length of track is approximately 6,000 feet. It is now getting close to vacation time and my wife and I are going to take our fourth Caribbean cruise. This time by Alcoa freighter, and for 25 days we hope to lead a carefree shipboard existence cruising in the warm climate along the northern coast of South America including Venezuela, British and Dutch Guiana and Trinidad before returning to the Gulf Coast. I extend a cordial invitation to you for a visit to Detroit and to visit our plant; perhaps I can convince you to get out of that Volkswagen into a car with our trim. With best regards, Gordon."

Your secretary is always asking for you to write in and many of you do—otherwise these notes would be pretty lean. I'm working on a new scheme which I would like to try on for size. It would seem to me that having a guest secretary every other month would vary the tone of the notes a great deal and get away from the stuff I keep handing you. An architect writing one issue a year would have to dig up something about his fellow architects and a fraternity man would find things in other directions. I'm asking for volunteers to write one issue of Class News a year. If the volunteer system doesn't work then you may get an assignment, so why not get the full glory. For this month this exhausts our space allotment, So Cheorio until next month.—**George Warren Smith**, c/o E. I. duPont de Nemours and Company, 140 Federal Street, Boston, Mass.

'27

If this issue reaches you before the reunion, just want to say that we are looking forward with pleasure to seeing you all at Oyster Harbors Club on June 8. As

you know, Alumni Day will be held on June 11, and we hope that many of you will be able to continue up to Cambridge. . . . **William L. Taggart, Jr.** has been nominated to the office of president of the Alumni Association of M.I.T., and **E. Robert de Luccia** to the National Nominating Committee for District 10. . . . At a recent luncheon meeting before the Rotary Club in Revere, Mass., **Laurence Burns** gave a scientific talk on the subject of "The Expanding Universe." Having played a prominent part in the development of fluorescent lighting, he showed some of the latest discoveries in lights and told of the great progress of scientists in space exploration. Laurence is now a research engineer and patent attorney for the Sylvania Electric Products Company and is recognized as an authority and collaborator in the patents and research on sodium arc, mercury, fluorescent and sterilizer lamps; he has written treatises for the American Physical Society, Journal of the Optical Society and the American Hospital.

I want to award honorable mention to **Mrs. Lester B. Woolfenden** for a very fine job in bringing us up to date on her family. She writes from Paducah, Ky., as follows: "So '27 reunion time is coming up soon! Since Les and I were grade school classmates, I also visited M.I.T. when he was there, so The Technology Review is as much of interest to me as to Les, having met so many of the crowd. I do hope you collect lots of news of the class families for The Review after the reunion. Les and I have two sons, Dr. Glen E. Woolfenden (Cornell, Kansas University and University of Florida), who is now professor of biology at the all new University of South Florida in Tampa. He has three children—Kim, Scot and Lisa. His wife, Gwendolyn, was graduated from the University of Wisconsin in physical education and was head of city events in Gainesville when they lived there. Glen is 30. Our younger son, Don, started at Cornell, then transferred from engineering to Mississippi State in hotel administration. His first job was with the Spencecliff Corporation in Honolulu Queen's Surf, Bare Foot Bar, Sky Room at International Airport, etc., then with the Royal Hawaiian, King Kam, etc. Of course, we went to spend Les' month vacation and had a marvelous time visiting Kona, Hawaii, etc. While there, Don, who is 27, met a lovely girl from Paris. She stopped to see friends of her father's who knew Don; they were introduced and married in Honolulu one year later. She is French, went to school in Switzerland, and a wonderful girl. Her dad is manager of maritime communications in the South Pacific for France! They are now in Lexington, Ky., Phoenix Hotel, where he is director of food and beverage, banquets and personnel. They are expecting their first child in April. Les and I have done a lot of public speaking here for clubs, schools, etc. and were made Kentucky Colonels for civic efforts. We still do a bit of it. This is the front of our ole Kentucky home (picture enclosed). The back is two stories high, and we have two acres of lawn (my pet project). We visited the Ralph Johnsons while in Hawaii—a

wonderful family! They have a gorgeous home and are so hospitable. We also hope anyone finding himself down in Kentucky in our area will feel welcome to come visit with us. We have spare rooms; just we two here. Have a wonderful reunion!" Also, accompanying this newsy letter was a snapshot of their three very attractive grandchildren. Thanks a million, Ethel!

At a recent industry luncheon, **Frank C. Staples**, President of the SuCrest Corporation, was one of the judges deciding the person to whom the award for "Sugar Man of the Year" for 1961 was to be given. This is an annual award given in recognition of significant and meritorious contributions to the sugar industry of the United States; it was established as a memorial to the late founder of B. W. Dyer and Company, sugar economists and brokers of New York City. . . . The March Newsletter of the Second Century Fund reports that heartening news came from all over the country on February 15 as the SCF Steering Committee received telephone reports from Area Chairmen. Alumni pledges of more than half a million dollars in the preceding eight days brought the Area total to \$6,722,819, well within reach of the Area Organization goal of \$8 million. It is apparent from the increasing rate at which pledges are being received that Alumni generally are determined to realize their part of the \$66 million campaign. It is felt that Alumni Day in June will see the Area goal met and even exceeded. By mid-February the Second Century Fund had reached a total of \$52,433,000, an increase of almost \$2 million since the joint year-end report was made.

The following new addresses have been received: Brigadier General **William R. Frederick**, Apt. 604, 4230 Hampton Street, Elmhurst, N.Y.; **George C. Houston**, 38 Park Street, Brookline, Mass.; **Henry W. Newell**, 373 Olmstead Road, Riverside, Ill.; **Mrs. Clara F. Smyth**, Box 610, Pocasset, Mass.; and **Dr. Carl H. Wies**, P.O. Box 751, New London, Conn. In our April Class News, we reported a new address for **Manuel R. Castellanos** in Arlington, Mass. This was in error, and his address is still 28 Watkins St., Lynbrook, N.Y.—**J. S. Harris**, Secretary, Shell Oil Company, 50 West 50th Street, New York 20, N. Y.

'28

We can well be proud of our class and its many members who continue to be recognized for outstanding achievements. Although mentioned briefly in last month's Class News, we have had further information and releases relative to **Bill Hall's** elevation to Raytheon's professional level V. The purpose of establishing this professional rank was outlined by the company's president in Raytheon News for February, 1962. A highly complimentary review of Bill's achievements appeared on the same page. . . . **Hall Hibbard** is co-author of a most interesting and readable paper on "Concept and Development of a Simple, Stable, and Economical VTOL Vehicle" which appeared

in Aerospace Engineering for February, 1962. Hall is now a senior vice-president, vice-president-engineering, and a director of Lockheed Aircraft Corporation. His entire professional life has been devoted to the aircraft industry. This began with his employment as a draftsman for Stearman Aircraft in 1928. He joined Lockheed in 1932. . . . At the American Power Conference, March 29, held in the Sherman House, Chicago, **D. W. Ver Planck** gave a paper on "Development of Gas-Cooled Reactors for Large High Temperature Steam Power Plants." Dennistoun is now assistant director of the laboratory, General Atomic Division of General Dynamics Corporation, San Diego, Calif.

A news release from the Public Relations Office of the Case Institute of Technology dated February 20 announced that **Ellis A. Johnson** has been appointed professor of management. Ellis was director of the Operations Research Office at Johns Hopkins University from 1948 to 1961, has served as technical director of the Air Force Office of Atomic Energy, was a commander in the U.S. Naval Reserve during World War II and was head of research for the Naval Ordnance Laboratory from 1939 to 1952. For wartime services he received the Legion of Merit from both the Navy and Air Force and the Distinguished Civilian Service Medal from the Navy and the Army. . . . An item in the Staten Island, N.Y., Advance for March 9, 1962, carried the interesting story that the North Shore Rotary Club had observed **Harold W. Northcutt** Night on March 8. This was in honor and recognition of Harold's long and active service in local civic, youth, welfare, and financial activities. Harold, now retiring from the Bethlehem Steel Company after 32 years of service, is moving with his wife to Morgantown, N.C. The club presented him with a membership in the Rotary Club of his new community. . . . I.A.S. News for March, 1962 carried the portrait of **John Stack** and the announcement of his election to honorary fellow of the Institute of Aeronautical Sciences. John has made aeronautical engineering his career since graduation and has been in research at Langley Field from the outset; he has held various important positions with NACA and NASA and won both honors and awards for his outstanding research relative to transonic flight of aircraft.

When you are reading these notes, it will be June and a very good time to start planning to attend our next reunion just 12 months hence. We are very pleased to announce that **Art Nichols** has agreed to act as chairman of the 35th Reunion of M.I.T. '28. The facilities of the Wychmere Harbor Club, Harwichport, Mass., have been reserved for the occasion. It is a beautiful spot right on the ocean and the house is famed for its fine meals. All of our reunions have been wonderful events and this one should equal any! . . . With deep regret we must record the death of **Harold D. Merrill** on October 12, 1961. Harold graduated in Course I, and much of his life work was in construction engineering. In concluding his biographical sketch for the 25th Year Class Report he wrote, "No medals, no honors, just a rough, hard-working engineer, but

I enjoyed every moment of it."—**Walter J. Smith**, Assistant Secretary, 15 Acorn Park, Cambridge, Mass.; **George I. Chatfield**, Secretary, 11 Winfield Avenue, Harrison, N.Y.

'29

Art Marsh, Course XV-2, has been elected chairman of the board of directors of Aerospace Nylok Corporation, Hawthorne, N.J. He has been a director of the company since its incorporation under a unique Nylok Corporation expansion plan which helps key Nylok executives found their own affiliated companies. Art is a manufacturer's sales representative in aircraft finishes, sealants, adhesives, compounds and metal cleaning and passifying preparations. . . . **Wally and Joan Gale** arrived back home at the end of March. They report having a wonderful month in Italy after touching at Singapore, Bombay, and Cairo on their month-long voyage from Hong Kong. . . . Your secretary received a very welcome note from Mrs. **Bill Aldrich** with a news release that Bill had been given the annual award of the Montana Building Material Dealers Association for his contribution to the community and the building industry. They extend an invitation to anyone in the Billings area, where they will be at home this summer. . . . Hope to see many of you at the Alumni Day on June 11.—**Fisher Hills**, Assistant Secretary, 62 Whittemore Avenue, Cambridge 40, Mass.

'30

For those of us who commute daily to Manhattan via Grand Central Station, **George K. Nakashima** has provided a pleasant diversion in the form of an attractively designed Japanese summerhouse on the main concourse. As many of you doubtless know, George has built up a considerable reputation in the industrial design field. His exhibit in Grand Central has been attracting crowds, although it should perhaps be conceded that the pretty little Japanese girls handing out literature on Kikkoma soy sauce may be a contributory factor. . . . After 13 years with Curtiss-Wright, **Frank H. Hankins, Jr.** shifted to Lockheed last year as manager of technical services at Idlewild. Frank and his family live in Franklin Lakes, N.J., where he is councilman and mayor. His daughter Anne, after graduating from Simmons last June, joined the Peace Corps and is now in the Philippines. Sons Tim and Frank are Dartmouth, '62 and '65, respectively. . . . In any list of assiduous workers in the M.I.T. vineyard, the **Harrington** family would rank near the top. Avid readers of the Class News may have noticed that the secretary of the newly graduated class of 1961 is Joseph Harrington 3d. **Joe, Jr.**, in addition to being our class president, is a member of the Alumni Council and vice-chairman of the Area Committee of the Second Century Fund. In his spare time he is

moderator of the town of Wenham. Joe's older daughter, Joan, graduated from Smith magna cum laude and is married to a naval aviator. Younger daughter, Anne, is a junior at Wellesley, majoring in music and conducting the madrigal group. . . . **Win Hartford** is a research supervisor at the Solvay Division of Allied Chemical. He has a son, Douglas, in the Class of '65 at St. Lawrence University and a daughter, Janet, in high school. . . . **Arthur (Jascha) Heifitz** and his family live in Andover, Mass., where he is president and treasurer of Andover Finance Company and vice-president of Temple Emmanuel. His two daughters, Phyllis and Estelle, both went to Boston University. They are both married and have presented him with three grandchildren. Son Steven attends Riverview School in East Sandwich. . . . February newscasts reveal that **S. George Lawson** has been appointed vice-president and general manager of Sylvania's semi-conductor division and that **Jim Biggane** delivered a lecture on labor relations to the Toledo chapter of A.I.I.E. Your secretary's recent talk on "Famous Patents," to the Trenton Section of A.C.S. didn't make the newspapers. Do we have any classmates in the public relations business?

—**Gordon K. Lister**, Secretary, 530 Fifth Avenue, New York 36, N.Y.; **Ralph W. Peters**, Assistant Secretary, 249 Hollywood Avenue, Rochester, N.Y.; **Louise Hall**, Assistant Secretary, Box 6636, College Station, Durham, N.C.

'31

A thoughtful note from Eduardo A. Icaza, '23, President of the M.I.T. Club of Panama, says that Major General **Robert J. Fleming, Jr.** has been appointed Governor of Panama. . . . **Jim Bryant** was a welcome newcomer at a recent Class of '31 luncheon at the M.I.T. Club of New York (the third Monday of each month). Jim is a rarity, having married an M.I.T. girl, Mildred Lister, '34. They have two married daughters and a number of grandchildren. He is sales manager of American and Efird Mills. . . . **Charlie Terwilliger**, another New York M.I.T. Club regular, is coming out with a new book, "The Horolovar Collection, A Comprehensive History and Catalog of 400-day Clocks, 1880-1912." (For more information, write the Horolovar Company, Box 299, Bronxville, N.Y.). . . . **Herb Raymond** was also at hand at the luncheon, as was **Marcel Aillery**, who seems to be running all over the world at the drop of a hat. . . . **Gabriel S. Cristofalo** has moved from Pleasantville, N.Y., to 212 Beach 136th Street, Rockaway Park, N.Y. . . . Colonel **Fred Elser** is now basking in sunny California at 787 North Sunrise Way, Palm Springs, Calif. . . . **Mary Handrahan** has left England and is now at 4 Ajax Place, Berkeley 8, Calif. . . . And **John K. Jamieson** has left Florida to transfer his allegiance to Texas. . . . It is my sad duty to report the death of **Robert M. Snyder** on February 15, 1962.—**Edwin S. Worden**, Secretary, 35 Minute Man Hill, Westport,

Conn.; **Gordon W. Speedie**, Assistant Secretary, 90 Falmouth Road, Arlington 74, Mass.

'32

As I write these notes we are looking forward to our 30th Reunion. Many of you have sent me interesting information about yourselves and families. For the moment I'll pass along dope on those who indicate that they will not be able to be at the reunion. . . . A three-man team took over the top posts of Dresser Industries, Inc., of Dallas on March 29, 1962, succeeding management which has guided the company for more than 30 years. At a meeting of the company's 12-man board of directors in New York, **John Lawrence** was elected board chairman and chief executive officer. He was president of Joy Manufacturing Company in Pittsburgh before joining Dresser in 1957. His major responsibility will be policy making and planning. Dresser has 14 divisions, supplying products and services primarily to oil, natural gas, chemical, water and sewage and power-generating industries on a world-wide basis. The company also has an electronics division. John has written to say that he and his wife will not be at the reunion as the wedding of one of their daughters takes place that weekend. . . . **Joe Welch** reports on his activity: "As you may have heard, the Cryovac Company is moving their headquarters to South Carolina early this fall, and I have decided not to leave good old New England and move down to the Bible and Hookworm Belt. So, after 10 years of a very pleasant association with Cryovac, I wound up my affairs last week and am now between assignments, as they say in the theatre. I haven't firmed-up my plans for the future as yet, but it looks like I will cast my lot with a New York firm, running their New England operation." . . . **Raymond C. Martin** is now assistant chief distribution engineer for Pacific Power and Light Company and has his office in Portland, Ore. . . . On a recent trip to Pittsburgh I tried to reach **Henry Rockwood** but found that he was in Washington for a few months in line with his duties as chief of the Weather Bureau Office at Pittsburgh. Henry has been with them since 1946. He reports to us: "In case I haven't mentioned it before, we have two children, Henry 3d, now a junior at Texas Christian University, Fort Worth, and David L., now an upper at Phillips Academy, Andover. Henry plans to become an economist, not wishing to follow me in science, but David should be a strong candidate for M.I.T. (except that he has visions of the West Coast, possibly Stanford.)"

Word comes from **Dick Huested** that he is with Air Arm Division at Westinghouse Defense Center in Baltimore as project manager. . . . **Bill Schoolfield** is now manager, Astro-Navigation Branch, Astronautics Division, Chance Vought Corporation in Dallas, Texas. . . . Between weddings and graduations we will miss many of our classmates at the reunion. **Carroll L. Wilson** has a son graduat-

ing from Exeter on June 10 and Carroll leaves for India on June 12. . . . I am sure that all of us send our best regards to **Bob McCaa** who cannot attend the reunion this year due to a severe heart attack in June, 1961. Let's hope that he can join us at the 35th. Bob writes, "Our son David is working on his Ph.D in physics at Ohio State on a research assistantship. He married Mary H. Miller last September 9. She is working on her M.A. in Spanish at Ohio State, where they met, on a teaching assistantship. She lived in Warren, Pa., was graduated from Wooster College, Ohio. Our daughter, Marian, was graduated as a history major at Oberlin College last June. She was selected as one of the first 12 Frontier Interns by the World Student Christian Federation, and after studying Korean at Yale last summer and fall, she flew to Seoul, South Korea, in mid-January where she continued to study Korean at Yonsei University and has now started three courses at Seoul National University. This is all as a means of doing Christian service work and teaching among the Korean University students of all faiths. I got to Oberlin for her graduation but missed David's wedding. . . . **Al Dietz** was good enough to stop here to see me on one of his trips to the city. Since then, I have been 'just on early retirement' by Minneapolis-Honeywell after 15 years of work there; which, being translated means 'laid-off.' My good wife, Helen, has obtained work with the United Presbyterian Church's Board of Christian Education in the city to keep us going." . . . A note of sadness brings this to an end. **Walter Guzewicz**, who attended the 25th Reunion, died in Presbyterian Hospital, Philadelphia, on February 11, 1962. Walter was president of Stainless, Inc., a steel fabricating firm. —**G. Edward Nealand**, Secretary, Room 3-137, M.I.T., Cambridge 39, Mass.; **Elwood W. Schafer**, Assistant Secretary, Room 10-318, M.I.T., Cambridge 39, Mass.

'33

Several of our distinguished classmates appear prominently this month; congratulations, boys! **Dayt Clewell** is now general manager of research and engineering for Socony Mobil. Dayt formerly worried only about research. . . . **Ing Madsen** has added to his responsibilities with the Association of Iron and Steel Engineers by becoming editor of their technical journal. . . . And **Ralph L. Garrett** is now the state fire marshal for Massachusetts; the boys in the dormitories who ring false alarms won't get any preferential treatment, we're sure. . . . **Albert Goldberg**, who heads his own firm of structural engineers in Boston, will apply his professional talents to a new large shopping center here in Cambridge. Al's daughter is married; one son is a sophomore at the University of Massachusetts and the other is a senior at Belmont High School. . . . Did you see the New York Times back in early February? A fine write-up of **George R. Vila**, President of U. S. Rubber, appeared as the 'Person-

ality of the Week' in the financial section. . . . Speaking of newspaper notes, we note in the society column that **Charlie Britton** is now a grandfather; and Charlie doesn't look a day older! . . . **Jim Turner** graced Boston recently to assure the local security analysts that Talon is still a good buy.

Two moves of note: **Maurice W. Kley (Kleinmann)** from Coral Gables, Fla., to Hartsdale, N. Y.; and **Richard S. Rowe** from Austin, Texas, to San Jose, Calif. How about the specifics, boys? . . . News from two distinguished brethren just as we go to press: **Niazi I. Mostafa** writes from his bed in Cairo where he is coping with a slipped disc. He reports that he and Mimi visited Canada, England, Germany, Switzerland, and Italy on their return trip from the United States. Musty left two first-rate representatives here: a daughter at Columbia Graduate School and a son, Tommy, here at Tech. The latter is the spitting image of Musty. . . . And one of those fascinating bits from our senior statesman, **Warren J. Henderson**. To paraphrase would not do Warren justice so let's quote him for full flavor. "On the good Saint's Day, Patrick, with an hour or so to wait for a plane departure, I ambled up to the sky lounge of Pan American, Miami, to wet the whistle. And, as I left the room, who opens the door for me but **Ellis C. Littman**, St. Louis? He was supporting the airlines again as he was mentioned doing in the January notes. This time he was making for the Bahamas, to give, as he put it, the kids a chance to get away from the snow and cold of the North. I was never in doubt that he, too, might well escape the same conditions, as he was right with them. Ellis looks real well, and, in my humble opinion, he is one of the best looking men of '33. A lot of them looked passable that year but have not stood up under the pressure of the years. Ellis has, or so it appears. Only incidentally, I myself was giving the airlines a boost by taking a few days off (haw) for some fishing in the Golfo de Panama. More specifically, the Golfo is roughly 5,000 square miles of the best fish hole I ever have seen. Most of my fishing with **Red Cole**, Vice-president of W and S Company, was done in the Archipelago de Los Perlas, a most marvelous group of islands in the middle of the Golfo. We caught 22 kinds of fish, but none of the two we wanted, Pacific Sail and Black Marlin. We saw quite a few sails, but nary a marlin. Red and I stayed at the El Panama Hilton for a few days, and I saw no Alumni, '33 or otherwise. One night the Canal Zone Policeman's Ball was held from 6:00 P.M. to 7:00 A.M. The ball was in full flower when we retired at 11:30 and was still blooming at 6:30 the next A.M." —**R. M. Kimball**, Secretary, M.I.T., Room 7-206, Cambridge, Mass.

'35

Last month we gave you excerpts from **Elmer Szantay's** letter telling of his flying trips to Florida every two weeks in his

Bonanza. I have the unhappy task of reporting to you that he did not make it back on his last trip. His twin Bonanza crashed Sunday afternoon, April 1 in Tennessee near the Kentucky border and all five aboard were lost including his 14-year-old daughter, Ann, his mother, his company's sales manager, and his best friend and poker companion. It is a tragic loss; his sister is taking care of the remaining four daughters. His wholly owned business, the Sandee Manufacturing Company, is continuing operations with the remaining management people. Our class will eventually elect a new regional secretary to replace Elmer Szantay, but we will miss him and the anticipated letters he initiated, and I will miss the golf game we had planned for his visit to the Boston area over Alumni Day weekend this June.

Nelson H. Thorp wrote in about **Richard R. Brown**. His letter follows: "Was quite shocked to read in the obituary column of the March issue of The Review of the death of a very good friend and classmate, Richard R. Brown. Dick was a graduate of Tufts and took his master's degree at Tech in 1935. He was one of the five graduates of the Class of '35 who were employed by the Panama Canal upon graduation. Dick worked in the refrigeration department of the Canal Zone and remained with them until about a year ago, when he left and went to work with the Becklet Corporation of San Francisco on a refrigeration project near Colon, Panama. Dick spent several years in the Navy during the war. Upon reading of Dick's death I wrote to the Canal Zone for particulars. Dick, who always seemed in excellent health, died very suddenly of a heart attack on October 30, 1961. He was buried in Watertown, Mass., on November 11. Dick was not married and is survived by his father, George B. Brown, 298 Mt. Auburn Street, Watertown 72, Mass. My wife and I got to know Dick very well during the two years we were in the Canal Zone. Saw him a few times at Alumni Day reunions and in 1960 when we took a Caribbean cruise Dick met us at the docks and spent the day with us, giving us a personal tour of the Zone and Panama. We enjoyed Dick's company very much and were saddened to hear of his death." Many thanks for your letter, Nelson. Next time tell us some more about yourself.

Laurence Stone brings us quickly up to date with the following letter: "To answer your two recent questions (my present home address and title), the address is 2034 Columbia Pike, Apartment 11, Arlington 4, Va., and the title (you had it correct) is colonel. Next week my office is moving from the Pentagon into a building known as Tempo J on the south side of the reflecting pool between the Washington Monument and the Lincoln Memorial. However, my business address, as you presently have it, remains Field Service Division, Office of the Chief of Ordnance, Department of the Army, Washington 25, D.C. Planning for the recently announced reorganization of the Department of the Army top echelons is progressing and some time during the next year I can expect to have a different

job and business address; but at present there is no indication as to what or when. I can think of nothing else to report. Should something arise of interest to you and our classmates, I will certainly write you. In the meantime, if you are in Washington and would like to see what the inside of a World War II temporary government office building looks like, just stop in at my new office." It was good to hear from you again, Larry, and I hope one of these days to be in Washington and see you.

Regional Secretary **Hal L. Bemis**, wrote in "to keep in your good graces," he says! "Last week I had lunch with **Harry W. England** of Havertown, Pa. He was in our class briefly taking a master's degree in naval architecture, after having graduated from the Naval Academy. After a very distinguished war record, he retired from the Navy as a captain, and most recently has been the planning director of the C. H. Wheeler Manufacturing Company. This company was recently absorbed by the Baldwin-Lima-Hamilton Corporation and as usually happens in mergers these days, Harry had to make a job change. He now is with Philadelphia Gear Corporation. I really enjoyed seeing him again as he is a very fine citizen. He has two children, one a daughter now in college." You needn't worry about lack of good graces, Hal, you have done fine. Maybe you can needle your district secretaries to help out.

It was good to get a letter from the "Father of Schoolboy Hockey" as the local papers call him, **Larz J. Anderson**. His letter follows: "Question: Do I have the doubtful distinction of being the only M.I.T. Grad in the ice arena business? If Olive Barnard were alive, I bet that she could tell without looking it up. The memories of our 25th are still with me. I wonder if anybody else had impressions like these: 1) Darn glad that you don't have to do it over again. Professor Greene said, 'We would never be admitted based on today's standards.' 2) The shock of seeing classmates age 25 years in what seemed like a much shorter time. 3) The thrill of seeing classmates making good, as evidenced by our substantial Class Gift.

"Getting back to ice arenas, my reason for being in such a business is, as I note with many M.I.T.'ers, the making of a profession out of one's hobby. It is an interesting challenge covering just about every phase of business and engineering. Ben Martin's Hockey Team visits my arena in Worcester to play W.P.I. so I get caught up on M.I.T. Athletics. 'We need a building over the M.I.T. rink' says Ben. . . . I got a kick out of a boy who attended our Eastern Hockey Clinic last year and introduced himself as the son of John A. Hrones, '34. John, as you recall, was captain and a tremendous defense man for our M.I.T. team. Time flies!" Many thanks for writing, Larz, and as I recall you didn't do so badly either on the hockey team in those days. I remember one game with Harvard at which 90 per cent of the varsity crew squad showed up to cheer. The high moment came when Tech tied the score at one goal apiece. The hockey team lost the game

four to one but they never forgot the cheer when they made that tying goal and neither will those of us there to watch it.

Leo M. Beckwith reports that as of April 12 our class has reached \$570,000 toward its goal of \$600,000 for the Second Century Fund. . . . **Lawrence C. Hall** has been elected vice-chairman of the Board of Governors of the New England Fire Insurance Association and is president of the New Hampshire Board of Underwriters. . . . **Gregory Flint** has been appointed manager of market development of Allied Chemical's International Division. Gregory lives in Mendham, N.J. . . . Army Reserve Lieutenant Colonel **Richard H. Eshbaugh** has completed the senior officer advanced operations course at the Army Command and General Staff College, Fort Leavenworth, Kansas. He resides with his wife, Vesta, at 636 S. Thurlow Street, Hinsdale, Ill. . . . Dr. **Howard S. Mason**, Associate Professor of Biochemistry at University of Oregon Medical School, had some remark of his quoted by Herbert Black, Boston Globe staff correspondent, in an article entitled "Cancer Experts Warn: Be Moderate on Anything You Put in Your Mouth." . . . **Jack Holley**'s latest move is from Allston, Mass., to Apartment F-12, 7407 Alvarado Road, La Mesa, Calif. . . . **Frederick L. Stephens** is with Colgate-Palmolive Company, 105 Hudson Street, Jersey City, N.J. . . . **Leslie Guy Haines** is now residing at Lows Hollow, Stewartsville, N.J. (There's a crew buddy it would be nice to hear from.)

I guess you all know M.I.T. has had some amazing athletic team successes in the last year: the crews won a flock of races with the varsity coming in a strong third at the Intercollegiates at Syracuse to top it off. The basketball team ended with a 17 won 4 lost record, winning 16 in a row after losing the first three games. The hockey team's record was so good they were given consideration to being invited as the small college representative to the Eastern College play-offs. Also, a year ago, M.I.T.'s baseball team finished a creditable third in the Great Boston five-college league after endlessly residing in the cellar. . . . Keep the letters coming to us—particularly you in the Midwest to whom Elmer Szantay had written in February.—**Allan W. Mowatt**, Secretary, 11 Castle Road, Lexington 73, Mass.; Regional Secretaries: **Edward C. Edgar**, Kerry Lane, Chappaqua, N.Y.; **Hal L. Bemis**, 510 Avonwood Road, Havertford, Pa.; and **Gerald C. Rich**, 673 Rosita Avenue, Los Altos, Calif.

'36

The Alumni Register has recorded the following changes in address: **Philip F. Clark** to 61 East Town Street, Norwich, Conn.; **Albert J. Delfavero** to 410 Sunnyside Drive, Nashville 5, Tenn.; Professor **Donald C. Spencer**, R.D. 1, Princeton, N.J.; also in Princeton, **G. Nelson Tower, Jr.**, at 6 Lafayette Road W.; to Carmichael, Calif., **Bernard B. Gordon** at

4420 Stoney Way; **Loreto Lombardi** from Mystic to 196 Tyler Avenue, Groton, Conn.; **Albert Musschoot** from Anchorage Ky., to 130 Old Dundee Road, Barrington, Ill.; **Charles W. Parce** with Valley Weathermakers, Inc., 900 West Van Buren, Harlingen, Texas. **Mark A. Princi** is now with the General Electric Company at 159 Lexington Avenue, New York 16; but the real prize goes to **Luigi Robinett**, who has moved from Prairie Village, Kansas, to Arlington Heights, Ill., and on to the American Telephone and Telegraph Company, 32 Avenue of the Americas, New York 13, N.Y.

On March 11 I found an item in The New York Times announcing from Dickinson College in Carlisle, Pa., that **Bob Woodward** would receive the college's Priestley Memorial Award for 1962. "The award, a portrait medallion of Joseph Priestley and \$1,000, is conferred annually for research, discovery or production benefiting mankind. Dr. Woodward is being honored for his synthesis of complex life molecules. The presentation will be made during Dickinson's annual Priestley celebration on March 30, a day-long program in memory of the discoverer of oxygen."

. . . **William A. Reilly**, formerly an executive with the New England Shipbuilding Corporation, South Portland, Maine, and Equitable Life Assurance Society, Portland, has been named head of the new Sawyer-Tower Products, Inc., operating five New England companies making vinyl-coated and neoprene-coated products. The five concerns make a complete line of industrial protective and safety clothing.

Major General **Marshall Sylvester Carter** has been named deputy director of the Central Intelligence Agency. He will serve as the principal executive officer of the CIA and will play a key role on the new U.S. Intelligence Board created by President Kennedy's order to oversee all U.S. intelligence operations. In his spare (?) time General Carter serves as a director of the International Ice Hockey Federation. . . . An article in Science World for January entitled "He Plays With Fire," describes Dr. **Bernard Vonnegut**'s theories on lightning and thunderstorms. . . . **Laszlo Reday** has been named director of dealer operations for Servisoft of California. Laddie is a vice-president of the company. . . . **Hank Lippitt** has supplied me with a prospectus of the Sierra Capital Company, in business to "(1) furnish capital to small business concerns which, irrespective of their fields of operation, are believed by the company to show capacity for expansion of their operations; (2) concentrate on such situations which may thereby eventually qualify for public ownership, or merger with suitable firms; (3) supply, on a fee basis, certain advisory services, with special emphasis on those which will help prepare such small business concerns for ultimate public ownership." A list of officers includes **Emanuel Rapoport** as vice-president and director. Hank also sent along a clipping from the San Francisco Chronicle telling about Joan Rapoport's activities in behalf of the YWCA in the Bay Area. She has been heading the membership drive at the Downtown Center, is serving on

the board of directors for the Y and was named YWCA Volunteer-of-the-Month for March. Joan spent her early years in Holland and England and came to this country on her way back to England from Tahiti at the start of World War II. She stayed here and was married in Chicago in 1943. She served as a radio commentator and toward the end of the war as a correspondent in Europe for the Chicago Times. Following the war, the Rapoports went on a combined business trip and delayed honeymoon to Brazil although as she remembers it "their romantic journey into the wilds of the jungle turned into a session of her sitting on the porch of their cabin furiously typing up notes for him." The couple has two boys, David, 13, and Philip, 11, and have been living in the bay area since 1954. My thanks to Hank for this information. . . . **Tony Hittl**, who has been elected chairman of the Good Government Party in Pleasantville, N.Y., where he lives, and **Hal Miller** journeyed to Boston to meet with **Vince Estabrook** and your secretary with reunion planners from the classes of 1937, '38, and '39. We hope the session was helpful to them. For us it was a pleasant get-together.—**Alice H. Kimball**, Secretary, 20 Everett Avenue, Winchester, Mass.

'37

This is the month of our 25th Reunion, and I believe we will break all records of attendance. Everyone who attends will carry away reawakened memories and for those not in attendance, the class book will be a book you will treasure. . . . **Paul A. Vogel** of Westport, Conn., has recently been appointed vice-president for development of the Unitarian Universalist Association. . . . **Charles H. Reed**, formerly Assistant Professor of Chemical Engineering at M.I.T., has been elected a vice-president of the General Electric Company. His headquarters are in Bridgeport, Conn. . . . **Bob Wolin** of Windsor, Conn., has been elected vice-president and chief engineer of Combustion Engineering, Inc. . . . I have received many comments on the request for a recent photo. Evidently I have helped many a portrait photographer, and the Polaroid camera business must be booming. The final results were far better than any of the previous classes, and I am sure you and your family will never regret the efforts you have made. We are looking forward to seeing all of you at our 25th Reunion.—**Robert H. Thorson**, Secretary, 506 Riverside Avenue, Medford, Mass.; Professor **S. Curtis Powell**, Assistant Secretary, Room 5-323 M.I.T., Cambridge, Mass.; **Jerome Salny**, Assistant Secretary, Egbert Hill, Morrisstown, N.J.

'38

This month we have news of a couple of promotions. **Howard Banzett**, who has been production manager of the Lan-

caster, Pa., Works of the Fabricating Division of Aluminum Company of America, has been promoted to the position of works manager. Howard has been with ALCOA since he left the Institute in 1939. . . . **Daniel N. Phillips** has been appointed eastern district sales manager for the Container Development Division of the Union Carbide Plastics Company. In this position he will have his headquarters at East Paterson, N.J. . . . We find the authors of the class still active. A recent paper by **Gus Rossano** is entitled "The Air Pollution Survey." . . . **Ely Mencher**, who is associate professor of geology, delivered a talk on "Problems of Caribbean Geology" at an Earth Sciences Colloquium in February. . . . And finally, **Fred Viles** presented a paper on the "Determination of Alkali Aerosols Using the Membrane Filter" at a meeting of the American Industrial Hygiene Association. —**David E. Acker**, Secretary, Arthur D. Little, Inc., 1424 Fourth Street, Santa Monica, Calif.

'39

Colonel **Thomas J. Hayes**, I-Grad, (West Point '36) who led the column of class notes in the January, 1962 issue, again leads off with more news. This time, a military news release says: "Top Missile Site Builder To Head New Army Engineer Space Construction Unit." As you read briefly in the January notes, Colonel Hayes had been serving as commanding officer of the Corps of Engineers Ballistic Missile Construction Office (CEBMCO) in Los Angeles, and was concerned with over a billion dollars of construction including 23 ICBM bases in 17 states. A year ago, he was awarded the Air Force Commendation Medal for his accomplishments on these ICBM facilities. In his new job, Colonel Hayes (recently nominated by President Kennedy for promotion to temporary brigadier general) will head a newly organized office to co-ordinate construction and other engineer support for the National Aeronautics and Space Administration. This work will include design and construction of several NASA facilities and acquisition of real estate for the projects carried out through four district offices: Jacksonville, Fort Worth, Mobile, and Los Angeles. Prior to relocating to Washington, D.C., in March, Tom and Jean Hayes lived in the Westchester district of Los Angeles, where their daughters Mary Helen and Barbara were in school. Their son Thomas is now a freshman at Duke.

Charles S. Mercer, XIV, has recently been promoted from department manager of the Morgoil bearing department of the Morgan Construction Company, Worcester, to vice-president. Chuck, formerly with Alcoa, joined Morgan in 1952 as a sales engineer for Morgoil bearings, and managed the department from 1956. He is a national director of the American Society of Lubrication Engineers, and a member of the Association of Iron and Steel Engineers. . . . Dr. **Gilbert E. Moos**, V-Grad, currently serves as associate professor of chemistry at St. Lawrence Uni-

versity, in Canton, N.Y. Gil, a '36 graduate of St. Lawrence, received his S.M. degree from M.I.T. in '37 and continued on to receive his doctorate in '39. He taught at Tech and at Rollins, worked at American Oak Leather Company and at Celanese Corporation, and returned to teach at St. Lawrence in 1952. He is a member of all the leading professional groups in chemistry, and is currently working on a book on biochemistry to be published by McGraw-Hill. He also broke into the news recently by the announcement from St. Lawrence that he will direct an undergraduate science education program under a grant from the National Science Foundation.

From Stanford University comes word that Dr. **Marvin Chodorow** VIII-Grad, is the new director for the Microwave Laboratory of Stanford's Hansen Laboratories of Physics. Professor Chodorow received his undergraduate degree from the University of Buffalo before getting his doctorate from the Institute in '39. He lives at Ladera, Calif., with his wife and two children. . . . I wonder how many '39ers picked up that note from the April issue of The Review on page 34 that **Lloyd P. Hunter**, VIII, has edited another McGraw-Hill book, the "Handbook of Semiconductor Electronics." Lloyd is director of component engineering at IBM's headquarters in New York City. . . . **Richard P. Feynman**, Professor of Theoretical Physics at the California Institute of Technology in Pasadena, will be awarded one of the Ernest Orlando Lawrence Memorial Awards for 1962 by the AEC for "important contributions to quantum field theory and particle physics, for invention of Feynman diagrams, and for broad scientific interests and knowledge." . . . **Louis D. Smullin**, VI-Grad, Professor of Electrical Engineering at M.I.T., recently gave a talk to the Boston Section of the Institute of Radio Engineers on "Electron Beam-Plasma Interaction." Before joining the Tech Faculty in 1955, Professor Smullin served as head of the Radar and Weapons Division of the Lincoln Laboratory, being responsible for the development of new high power ground and airborne radars. . . . **Arthur S. Douglass, Jr.**, IV, is serving as architectural consultant for Sweet's Catalog Service of F. W. Dodge Corporation, a division of McGraw-Hill. Arthur is active in the American Institute of Architects and the Architectural League.—**Oswald Stewart**, Secretary, 31 Birch Road, Darien, Conn.

'40

Tom Jones, who is head of Purdue's Electrical Engineering Department, recently gave a talk on his plan for "Electronic Industry-University Research Partnerships" and described Purdue's extensive plans to halt the exodus of brains from the Midwest. Apparently, Tom is not practicing what he preaches, since he has just accepted the presidency of the University of South Carolina. . . . **John Casey** has also moved upward and is now senior vice-president of operations and a member of the board of directors of Sea-

bord World Airlines, Inc. John will be responsible for both flight and ground operations for the airline which provides scheduled cargo service between the United States and principal European cities. . . . **George W. Alexander** is now engineering manager for the Heavy Metals Department of the Engineering Works Division of Dravo Corporation. . . . It is with regret that I report the death on June 23, 1961, of Miss **Abbie M. Buck**, who was associated with us in Course VII. Abbie resided in Augusta, Maine.—**Alvin Guttag**, Secretary, Cushman, Darby and Cushman, American Security Building, Washington 5, D.C.; **Samuel A. Goldblith**, Assistant Secretary, Department of Food Technology, M.I.T., Cambridge 39, Mass.

'41

In the news this month we find **David S. McNally**, who has been appointed vice-president of the Amphenol Connector Division, Amphenol-Borg Electronics Corporation. He serves as general manager of the Amphenol-Western Division, Chatsworth, Calif. Dave was formerly vice-president, marketing, for the Industrial Products Division of I.T.T. Electronics and had previously been vice-president and general manager of the Kleinschmidt Division of Smith-Corona Marchant Company. . . . In an announcement from the Chrysler Corporation we find that **Lewis D. Fykse** has been appointed manager, Marketing Plans and Programs, for the Chrysler Corporation's Automotive Sales Group. Lewis had previously been director of marketing for the Associated Spring Corporation of Bristol, Conn., since 1959. As manager of marketing plans and programs, he will be responsible for developing and recommending corporate marketing objectives, policies and plans and will also be responsible for other activities associated with volume planning in the sales and marketing field. Prior to joining Associated Spring Corporation, Lewis had held executive positions with American Machine and Foundry Company, N.Y., the Harris-Seybold Company, Cleveland Hardware and Forging Company and the Standard Tool Company, all in Cleveland. He is a member of the American Marketing Association, American Management Association, American Society of Mechanical Engineers and the M.I.T. Club of New York City. He was born in Milwaukee, Wis., on May 16, 1919.

William J. Baldwin, Manager, Technical Services, Pacific Coast Area of Allegheny Ludlum Steel Corporation, has been appointed manager of Sales Development and Engineering Services. He will be headquartered at the Company's Brackenridge, Pa., Works. A native of Iowa, Bill served as a captain in the U.S. Army Engineers during World War II. He joined Allegheny Ludlum in 1941 as a research metallurgist at the Brackenridge Works, and in 1945 was transferred to the Watervliet, N.Y., Works, where he served as mill metallurgist, chief metallurgist, and assistant manager of the

works. He was named manager of technical services in 1954. Bill is a member of the Society of Automotive Engineers, American Society for Metals, American Institute of Mining and Metallurgical Engineers, and various Masonic bodies. He and his wife, Alice, with their three sons, Timothy, Peter, and Mark, reside at 1007 Hulton Road in Oakmont, Pa. . . . **George R. Bises** has been recently appointed assistant vice-president of Gibbs and Hill, Inc., consulting engineers, designers and constructors with headquarters in New York City. He is serving in the capacity of European manager with headquarters in Milan, Italy. George was born in Rome, Italy, and served in the Army Corps of Engineers in Europe during World War II. He has worked for Stone and Webster and Ebasco, and in 1946 became a partner in A. and G. Bises Company, serving as consultant to foreign concerns in purchases of machinery and chemicals. He joined Gibbs and Hill in 1950 and returned to his native Italy in 1951 where he co-ordinated field efforts for construction and start-up of four power stations. In 1954 he became resident manager of Spain and in 1957 he became resident manager of Europe. George and his wife, Juliana, with their children, Laura, 12, Anne 10, and George A., 6, reside in Milan, Italy. . . . Professor **Morris Neiburger** of the University of California, Los Angeles, has been elected president of the American Meteorological Society for the two-year term of office 1962-3. . . . We are all looking forward to M.I.T. Alumni Day, June 11, 1962, and hope to see you there. . . . Please keep the news items for this column active and moving by sending them to any one of the secretaries.—**Walter J. Kreske**, Secretary, 53 State Street, Boston; **Henry Avery**, Assistant Secretary, 169 Mohawk Drive, Pittsburgh 28, Pa.; **Everett R. Ackerson**, Assistant Secretary, 16 Vernon Street, South Braintree 85, Mass.

'42

Alfred Goldis has written to us that he has recently assumed the presidency of Polytechnic Capital Corporation of 50 Congress Street, Boston, in addition to his regular duties as 20th Reunion Chairman. He wrote that, "Polytechnic Capital Corporation is a newly organized SBIC, the *raison d'être* of which is the making of sympathetic, long-term venture capital loans and/or equity investments to small businesses of all kinds, but especially those which are scientifically and technologically oriented." Al also points with considerable pride to his high calibre board and technical advisory committee, many of the members of which have been recruited from M.I.T.'s Faculty and the Class of '42. . . . Professor **Robert T. Howard, Jr.** was in Boston recently, from his position at the University of Wichita, to attend the Metals and Materials Conference at the Institute. In the course of a very pleasant chat he told me that Tech, with the help of a Ford Foundation grant, has been going all out to help other universities. In addition to

his other duties, he is also working under a National Science Foundation grant to develop teaching aids in materials science and metallurgy. For summer activity he has been participating in the Boeing Aircraft faculty program by teaching courses in operations research. Back on campus he is president of the Wichita chapter of the American Association of University Professors. Bob and wife will be at the reunion, but their five youngsters—girls 14 and 13, boys 7, 4 and 3—will remain at home.

Through the kindness of the secretary of the Class of 2-'44, Paul Heilman, we received a copy of Angela and **Ben Skinner's** annual letter. Ben set up Allied Precision Products, Inc., in Dunedin, Fla., back in 1951 and writes: "Business here has been good; however, what we make on one part of the business we seem to pour down the drain on wild goose chases on another part, so I haven't made my first million yet, but I am still working at it. Our oldest boy, Don, will be 18 in September, and enters the University of Florida this fall, with hopes of eventually becoming an M.D. The rest of the children (Rick, 14; Mary, 13; Nancy, 10; and Susan, 8) are all healthy, happy, frisky, and doing well in school. Rick is the athlete, Mary is the cook, Nancy is the motherly type, and Susan is the family cut-up, with red hair, believe it or not. Angela and I are extremely happy and well. She was in Mexico for two weeks in February with her mother. I believe this is the first time she has been away from the children for 18 years, and since her brother invited her to come down and stay with them when my mother-in-law returned, we took him up on it to see how it would work out. She had a good time and a good rest, so I will recommend it to the rest of you girls, that is if you can talk your husbands into baby sitting and dishwashing for ten days to two weeks!"

At the American Power Conference in March **Charles Strohmeyer, Jr.** presented a paper entitled, "Large Sub- and Supercritical Steam Generator Start-up and Control System Integration with the Turbine Generator." Charles is project manager with Gilbert Associates, Inc. of Reading, Pa. . . . **Robert W. Seavey** is a nine-year-veteran school committeeman in Raynham, Mass. During the past year he was chairman and was recently re-elected. Professionally he is manager of the Thermoelectric Laboratory of Texas Instruments in Attleboro. He is active on the Bridgewater-Raynham Music Festival Committee and other community affairs. The Seaveys have three daughters. . . . We have fairly often reported on the activities of Dr. **Robert C. Seamans, Jr.**, Associate Director of the National Aeronautics and Space Administration. Every time, however, he gives another public talk we pick up a few more news notes on his career; in February he was awarded an honorary degree by Rollins College of Winter Park, Fla. . . . The Alumni Register reports the Navy promotion to Captain for **Bernard W. Moulton**. He is staff commander, U.S. Naval Forces, Japan. . . . In case you haven't seen **Charlie Stempf** lately, it's because he

moved from London to 164 Barrenjoey Road, Newport, New South Wales, Australia. . . . Your gardening and golfing secretaries, **Ed Edmunds**, **Bob Keating** and **J. J. Quinn**, hope you will all be at the reunion and that we have warm sunny New England weather.—**Lou Rosenblum**, Secretary, 24 Cedar Road, Belmont 78, Mass.

'43

Frank E. French, Jr. was appointed sales manager for industrial products in the DuPont Company's Dyes and Chemicals Division. Industrial products comprise a broad group of organic chemicals, including water repellents and various textile finishing agents, which are supplied to the textile, paper, leather and other basic industries. Dr. French joined DuPont in 1948 as an engineer in what is now the Industrial and Biochemicals Department. After successive assignments as research supervisor, manager of engineering development, assistant technical superintendent of the East Chicago, Ind., plant and staff member of the Development Department, he was transferred to the Organic Chemicals Department in 1959 as manager of new products and market development for "Freon" products. The following year he was named development manager of the department's research and development division, a position he has held until his current appointment. . . . **Morton F. Spears**, Vice-president of Engineering at Pickard and Burns, lectured at the 1962 I.R.E. Lecture Series in May on the subject "VLF Propagation and Antennas." He has supervised the construction of many VLF navigation, communications and timing systems.

Shao T. Hsu, was one of the speakers at a panel of the American Power Conference held at the Sherman House in Chicago in March, on the subject of development of a multi-fuel fired heater for applications in polar environments. He is associate professor of mechanical engineering at the University of Wisconsin. . . . **Barrett B. Russell**, 3rd, has moved from Houston, Texas, to DuPont in Wilmington, Del.; **Alvaro C. Masias y Do-carmo** has moved from Lima, Peru, to Mexico City. . . . Your roving secretary had a pleasant telephone conversation with **Bill Lacy** of Orlando, Fla., in April. Bill has been north on occasion for the June reunions, and is definitely planning to attend the 20th Reunion in 1963. . . . I also talked with Hilda **Calleja**, our class agent's lovely wife, who informed me that things are getting better all the time for them in Florida, and that **Gus** is planning to attend Alumni Day at M.I.T. this June. . . . By the time you read these notes the Second Century Fund program will be completed, and you will have received the list of those members of our class who contributed. I am sure that our class will be among the leaders in contributions, both dollar-wise and percentage-wise, and I hope that all of you will continue to be active in the Alumni Fund, where we have held such

an outstanding position for many years. . . . Dr. **Herbert Goldstein**, who received his Ph.D. in Course VIII with the Class of '43, was one of five American scientists to be awarded the Atomic Energy Commission's Ernest Orlando Lawrence Memorial Award for 1962 "for significant contributions to reactor physics and to nuclear cross sections, and for leadership in establishing a rational scientific basis for nuclear shield design." Dr. Goldstein is the author of "Fundamental Aspects of Reactor Shielding," published in 1959. . . . During the summer President **Jim Hoey** plans to appoint committees for work on the 20th Reunion; it would help him a great deal if he heard from those persons who are interested in working on this affair.—**Richard M. Feingold**, Secretary, 10 North Main Street, West Hartford 7, Conn.

2-'44

Once more I'm happy to say that a little nudging on your secretary's part has produced some very interesting notes for the month. First, I have received a couple of newspaper articles, one from the Cincinnati Enquirer, which reports that Dr. **Alan S. Michaels**, X, gave a talk on "Wetting Solid Surfaces" to the Ohio Valley Section of the A.I.Ch.E. . . . A report from the New Haven Register indicates that Dr. **Paul Talalay**, X, was given the largest grant ever offered to an individual by the American Cancer Society. He is presently living in Shelton, Conn. . . . A note from **Henry Lurie** which was the result of a phone call while I was in Cincinnati, asks to clarify what class he is with. According to the register that I have Henry you are with the class of '44, so I shall use the rest of the news in your letter. Henry is one of the few who have stayed in the profession as a private consultant. He and his organization specialize in meat packing plants and other food processing installations. There are three little Luries: Sally, 11, Bobby, 9, and Debbie, 7, and Virginia Stix Lurie. The Luries live in Cincinnati and vacation in Michigan at Murray's Inn.

Another note which brings information on a number of the members of the class comes from **King Cayce**, II. I shall quote it verbatim: "I sold my manufacturing business, the Cayce Corporation, in 1954 and since that time have been in business for myself as a management and financial consultant. My biggest activity has been with the General Tire and Rubber Company. My first work with them was on corporate acquisitions and mergers and since 1957 it has been confined to investments for their pension fund. In October, 1960 Pat and I and our children and our two Siamese cats moved to New York City. Now we commute to Cleveland and Akron occasionally and to our beach home in Delray as regularly as we can. **Jim Mulholland**, IX, and I played golf this summer; Pat and I get a chance to see Jim and Clare all too infrequently, although they don't live very many blocks from us. Jim and his partner have put

together one of the astounding publishing businesses in New York, and their company, the Hayden Publishing Company, will be underwritten and publicly available by the time you receive this letter.

"**Alan Rose**, VIII, called us while in New York last week and came for dinner. Al and his wife Betty (Pat and I met on a blind date and the introduction was arranged by Betty) live in Tarzana, Calif., with their family in a nice new home. Al is with the Patent Department of Litton, which, incidentally, has been one of our favorite investments. A couple of months ago I was having breakfast in a midtown restaurant with a business friend when I was approached by an Irishman with a deep suntan and a heavy accent. **Jim Healy**, XIII, was on one of his trips to New York. Jim was working for Alcoa Steamship Line and landed in Surinam (Dutch Guiana) where he found things interesting. He quit his job and established a chain of supermarkets. He has his own plane and flies from his place in the mountains down to stores on the seashore. He also operates as an agent for Alcoa Steamship Lines. We certainly admire his shaking up the dice as he has, and we were fascinated with the kind of life he and his family live. Jim apologized for not being able to see us again; but, after all, he had been in New York about three days and that is about as long as anybody can stand it. He just had to get back right away.

"As properly reported in The Review, **Clyde C. Snyder**, XV, has been to see us a few times and spent a short weekend with us at our home in Delray. **Court Ames**, XVI, pops in from time-to-time, and I usually talk to him when I am in San Francisco. He is with McKinsey and Company and has been commuting between San Francisco and Houston, where he has regular occasion to pay his professional respects to a valued client in the aircraft industry. He and his wife Dorie and their children live on the peninsula not too far from **George** and **Clara Quisenberry**, XIII. Someone has told me that George is now one of the owners of his company." Thanks a lot King for all the news!

One final bit of news, is a note from **Jay and Tink Martin**, II, indicating that they have moved to Weston, Mass., from their home of some 10 years in Melrose, Mass. The most interesting part of the note is that the moving date was Friday, April 13. No superstition there! While on the subject of moving, your secretary is moving from Norwalk to Westport. Since this is the next to the last Review before summer, I hope that some of you will plan to stop in and bring me up to date for notes next year.—**Paul M. Heilman**, Secretary, Reflectone Electronics, West Main Street, Stamford, Conn.

'46

As reported here a few months ago, some of our class officers have been retired to pasture. **Ned Tebbetts** has recently turned over his accounts to **Ken**

Davis, and I think his transmittal letter is worth recording here. "With the recent settlement of our last outstanding reunion bill, I can now enclose a check for \$563.17 which represents the size of our M.I.T. Class of 1946's treasury as of January, 1962. May you and your committee enjoy great success in investing these funds. As can be seen from the accompanying statistics comparing expenses for the 5th, 10th and 15th Reunions, the principal reason for the loss on the 15th Reunion is that considerably more money was spent for the pewter pitcher gifts to class members attending than had been spent for similar purposes at previous reunions. However, I believe our committees for these three past reunions have planned well and prudently in creating a class treasury that is as large as \$563.17. I doubt if many other classes of our era have built up a treasury of this size."

The personal communications from you to me have been conspicuous by their absence in the past few months. We have received some newspaper clippings so all is not lost, but I would appreciate a note from each reader telling me of present job, wife, number of children, and any other interesting information such as publications, trips, windfalls, golf scores, etc. . . . **Dave Moyer**'s new address is 28 Arbutus Avenue, Chelmsford, Mass. . . . **Ernest P. James** is a professor at Lowell Technological Institute and director of their summer session. . . . **Dave Sherrick** is now associated with Stelma, Inc., a Stamford, Conn., firm which is in the electronic communications equipment field. Dave is manager of technical liaison, and is located in Washington, D.C. . . . **Hamilton O. Hauck** has been promoted by the Raytheon Company to be general manager of their Missile and Space Division at Santa Barbara, Calif. Admiral Hauck is a graduate student associate of our class. He retired from the Navy in 1958 as a rear admiral. . . . **De Ross Salisbury, Jr.** was recently ordained to the priesthood of the Episcopal Church. After graduation from M.I.T., De Ross worked at the Norton Company in Worcester until his decision to leave the business world. In 1958 he entered Bexley Hall, Theological Seminary School. Reverend and Mrs. Salisbury have three children and live at Sheffield Lake, Ohio.

George Fry and Associates have announced the appointment of **Richard J. Steele** to the newly created post of associate. Dick is assistant manager of the Fry office in Los Angeles and has been a member of the Fry organization for 11 years. He has handled a broad range of consulting assignments for major business and industrial companies in the areas of marketing, industrial engineering and management organization and controls. Dick lives at 15519 Talbot Drive, La Mirada, Calif. . . . **Seward J. Kennedy** has been named counsel for Mobil International Oil Company's northern and southeastern European region. Headquarters for this region are in London, so we assume that the Kennedy's will be moving soon. . . . The Worthington Corporation has announced the appointment of **Robert F. Hoffman** as manager of manufacturing at their Harrison Division, N.J.

. . . Dr. **Ali Bulent Cambel**, Professor of Mechanical Engineering at Northwestern University, Evanston, Ill., spent the month of March travelling in the Southwest and lecturing for the Society of Sigma Xi at many universities and colleges on the subject of "Magneto-Gas Dynamics: Its Science and Technology." Please sit down right now and drop me a line.—**John A. Maynard**, Secretary, 25 Pheasant Lane, North Oaks, St. Paul 10, Minn.

'47

Fellow classmates: This June, 1962, issue of The Technology Review should arrive just before Alumni weekend. It is for this reason that these notes are particularly brief, and limited exclusively to the forthcoming festivities of our 15th Reunion and Alumni Day. Several weeks ago I received a letter from **Claude Brenner**, which advised your correspondent that the reunion would be held at the Griswold Hotel and Country Club at Groton, Conn. He indicated that there are many activities available at the hotel, such as free golf, tennis, badminton, handball, and even complimentary sightseeing trips around Long Island Sound on the hotel's boat. From his letter it was indicated that the following couples will be present at the reunion at the Griswold: Louis and Dorothy Goodman, Robert and Eileen Aquadro, Philip and Jo Ann Johnson, Laurent and Elizabeth Michel, Robert and Carol Horowitz, Laurence and Phyllis Powell, Irving and Marjorie Schwarz, Sidney and Edna Grob, Michael and Virginia Rosar, James and Jane Phillips, Alex and Carter Giltinan, Jordan and Rhoda Baruch, George and Nancy Katz, Kenneth and Lois Marshall, John and Mary Jane Bender, Cyril and Beatrice Brown, Harl and Lois Aldrich, James and Arline Prigoff, Jack and Karen Rizika, Walter and Jill Kisluk, Harry and Betty Sherman, David and Patricia Knodel, Morgan and Daphne Cooper, Edwin and Carol Rosenberg, Philip and Joan Jones, Marty and Jan Phillips, Parker and Jane Symmes, Morton Loewenthal, Robert Devine, John Holmes, Claude Brenner. As this was the early bird list, I am certain that our turnout at the reunion this year will be nothing less than spectacular. If you haven't already sent in your reservations and your class dues, please do it as this is your final opportunity before the big weekend. If you decide to attend the reunion festivities, I am certain that the Griswold is large enough to accommodate you, in the event that you haven't already sent in your reservation. Remember the dates—June 8, 9 and 10.—**Arthur Schwartz**, Secretary, 8355 Blackburn Avenue, Los Angeles 48, Calif.

'48

The mail bag this month was replete with clippings concerning appointments, promotions, and elections, all of which

would seem to indicate that ours is a class of achievers. I had hoped that this would be my record in length of column, but discovered upon reading the April issue that someone had beat me to the punch on a couple of items. I could make up for this by rambling on for a line or two about the Maine winter, but of much greater importance and interest is the fact, for example, that **Donald J. Atwood, Jr.** has been appointed director of engineering for the Oak Creek and Milwaukee plants of the A.C. Spark Plug division of General Motors. He is in charge of A.C.'s engineering activities at its three Milwaukee area plants and its Boston and Los Angeles research laboratories. He goes to Milwaukee from Boston where he headed A.C.'s Advanced Concepts Research and Development Laboratory. . . . The board of directors of Plume and Atwood Manufacturing Company of Thomaston, Conn., have elected **Cornelius L. Hudak** to the office of vice-president of sales, elevating him from the position of general sales manager which he has held since last year. . . . **Robert A. Wofsey**, of Arthur Young and Company, gave a talk on "Accounting Shortcuts for Both Large and Small Business" at a meeting of the Waterbury Chapter of the National Association of Accountants. . . . **Frank Stabala**, of Edgerton, Germeshausen, and Grier, Inc., is listed as commander of his company's organization within Joint Task Force 8, which will make plans and preparations for and conduct as authorized a series of atmospheric nuclear tests to secure scientific data for the development, design and effects of nuclear devices should such nuclear testing be initiated. . . . Brigadier General **John Frederick Thorlin**, U.S.A., is commanding general of the Ordnance Tank-Automotive Command in Detroit, Mich., and last October was given the additional duty of executive director, Military Automotive Supply Agency, i.e., responsibilities for automotive supplies for not only the Army but the Air Force, Navy, and Marine Corps as well. General Thorlin obtained an M.S. degree in mechanical engineering from M.I.T. in 1948 and was made a member of Sigma Xi honorary research fraternity as a result of his thesis on armor plate. His tour at Tech was preceded and followed by a most distinguished career in Army Ordnance, and it is regrettable that space here does not allow a full exposition of the details. He is a graduate of West Point, '33.

Edward P. Mikol, Professor of Mechanical Engineering at the University of Wisconsin, was co-chairman of the Symposium on Cooling Water at the American Power Conference held at the Sherman House in Chicago on March 27-29.

. . . **John E. Schremp** was promoted to colonel in recent ceremonies at Carlisle Barracks, Pa., and received his eagle from Major General Thomas W. Dunn, commandant of the U.S. Army War College where the colonel is a student. . . . **Bob Peterson** has gone into business for himself as an independent electronic manufacturers' representative and will be covering central and eastern Pennsylvania and central and southern New

Jersey as sales representative for a number of companies. . . . Dr. **Alex Bavelas**, Professor, Department of Psychology and the Graduate School of Business, Stanford University, has been elected to the Council for the Advancement of Science Writing, Inc. Professor Bavelas joined the Stanford faculty in 1958. He was a professor at Tech from 1954 to 1956, and he received his Ph.D. from M.I.T. in 1948. . . . **Arthur H. Kuljian** has been elected president of the Kuljian Corporation, Philadelphia, by the directors. He was previously vice-president of the company. . . . Dr. **William J. Harris, Jr.** has joined the executive staff of Battelle Memorial Institute, Columbus, Ohio, research organization, as assistant to the vice-president. He will follow national trends in scientific research and development and undertake related studies, and will be in charge of the Institute's Washington, D. C. office. He is presently a member of the National Planning Association's Committee on Contributions of Military Research to Civilian Development and of the Structures and Materials Panel of NATO's Advisory Group for Aeronautical Research and Development. He was awarded his doctorate at Tech in 1948. . . . **Norman S. Zimbel** has been named head of the MITRE Corporation's Computer Systems sub-department. He will be responsible for developments in the area of advanced computer technology applicable to command and control systems. He and his wife and three children live in Newton Centre.

By the time you read these notes summer will be just around the corner, and we remind you that June 11, Alumni Day, is just around the next weekend.—**Richard H. Harris**, Secretary, 26 South Street, Grafton, Mass.; **Harry G. Jones**, Assistant Secretary, 94 Oregon Avenue, Bronxville, N. Y.; **Herbert S. Kindler**, Assistant Secretary, 128 Elatan Drive, Pittsburgh 16, Pa.; **Robert R. Mott**, Assistant Secretary, Box 113, Hebron, Maine.

'49

Because of a slight misunderstanding, the April column was very short indeed; in fact, it was nonexistent. As a result, there is some holdover information to be included this month. . . . Chicago Bridge and Iron Company announces the appointment of **Richard W. Warren**, XVII, as manager of sales for Germany, Holland and Italy. He will move from CB&I's foreign sales department in New York; initially he will be located in the Hague, Holland, and later in Germany. . . . **Thomas E. Sterling**, XV, was admitted to practice before the U.S. Court of Claims in Washington, D.C., in December. He is the legal assistant to the president of Pennsylvania State University and is already a member of the Supreme Court of the United States, the bars of New York, the District of Columbia, and of other federal courts. In addition to the degree from M.I.T., he has an engineering degree from the University of Cincinnati, and he satisfied his legal-acade-

mic requirements at the University of Rochester and the George Washington University Law School. . . . West Virginia Pulp and Paper has transferred **Eldred G. Peck**, II, to the production staff of Riges, S. A., the company's Brazilian subsidiary. After a few months of familiarization, Mr. Peck will become production manager for Rigesa and will be responsible for a pulp and paperboard mill and a large corrugated box factory, at Valinhos, State of São Paulo. Recently Mr. Peck has been production manager of West Virginia Pulp and Paper Company's Hinde and Dauch Division plant in Richmond.

I received a very nice letter from **Thomas J. Lamphier**, Course I, under a letterhead which shows him to be director, economic research of the Great Northern Railway Company, St. Paul, Minn. Here it is: "I was especially interested in the biography of **Jack Barriger** in the November, 1961, issue of The Review, inasmuch as he is one of the few members of our class who has accepted the challenges of the railroad industry. I was also interested because I am one of those who have also chosen the same industry, and our careers have to some extent been similar. After graduation in June, 1949, I joined the Great Northern Railway Company as a chairman in their Mesabi Division engineering party at Superior, Wis. In 1950 I was appointed assistant to the division roadmaster at Grand Forks, N.D., and in 1951 was appointed district roadmaster at Watertown, S.D. In this position I was responsible for maintenance and repair of track on 267 miles of branch line in Minnesota and South Dakota. It was while stationed at Watertown that I met my wife, the former Mallean Thiedeman. We were married in 1953. In 1952, I was appointed transportation inspector on our lines east of Williston, N.D. On the Great Northern the inspector is primarily concerned with operating rules and the compliance of the employees with these rules. He is also one of the general manager's lieutenants. In 1953, I went to the Twin Cities as assistant trainmaster and, as with Jack, I had the 7:00 P.M. to 7:00 A.M. shift most of the time. In 1955, I was transferred to the accounting department where I became co-chairman of the Computer Research Committee. Our problem was to determine whether or not we should consider the use of electronic data processing equipment in the operation of our business. We decided to go forward, and in 1956 I was appointed director of systems and programming, helping to get our computer systems going. We now have four general purpose computers and one special purpose computer (all UNIVACs). In 1957 I was appointed assistant to the vice-president-Executive Department with special duties, and in 1958 was appointed to my present position as director of economic research. Our research group has carried out some very interesting, and we hope, useful projects, some having to do with equipment utilization, market research studies including one on the effect of the decentralization of industry on transportation requirements. For the past several months we have been spending all our time

on the merger of the Great Northern and the Northern Pacific, the Chicago, Burlington and Quincy, and Spokane, Portland and Seattle Railways. Our case is now being heard by the I.C.C. Mallean and I live in St. Paul and have two delightful children, Jon, 7, and Christine, 2. Except for attendance at Alumni meetings, the Class News are my only contact with M.I.T., and I enjoy them very much. Keep up the good work."

Your secretary spent the latter half of March in London. This gave me the opportunity to visit **John and Geri Kunstadter** and to partake of their wonderful hospitality. John has been traveling a great deal in his overseas assignment for Formfit. They have set up factories in Jamaica, France, and England, and are busily marketing the resulting production. Both John and Geri were just coming to a realization that their return to the United States in September will come as quite a shock now that their adaptation to life in London and the continent is nearly complete. . . . At the time of my visit to London, **George and Edie Piness** were touring Europe, and rumor has that other '49ers are due to visit England and the Continent this spring and summer. . . . During my absence the Executive Committee of the Class of 1949 met to fill a vacancy for class representative to the Alumni Council. **Archie Harris**, who has filled this position, has left Boston for greener pastures with the Autonetics Division of North American Aviation in Anaheim, Calif. Archie will continue as class agent, but will be unable to attend monthly Alumni Council meetings. Our Executive Committee now consists of the class officers plus **Kemon Taschioglou**, Bill Jones, Wally Row, Joe Lynch, George McQueen, and Fletcher Eaton.

Russ Cox, our Class President, informs me that **Kemon** was appointed by the Executive Committee to be the new class representative to the Alumni Council. In his letter Russ continues with other news of interest to the class as follows: "For Alumni Day in June the class will have its own cocktail party from 4 to 6 P.M. in a private dining room at the Faculty Club. This special arrangement will attract many classmates who cannot attend the entire Alumni Day Program. We hope some will join us who can only stop for a brief hello on the way home. **Wally Row** is chairman for this affair and is making the arrangements.

"Incidentally, **Bill Edgerly**, who is now treasurer of Cabot Corporation, was recently honored by election as a director of the State Street Bank in Boston. Bill was president of the M.I.T. Club of Boston last year and has been chairman of the SCF drive in his home town of Wayland. I also understand **Harold Bud Rorschach** was on a nationwide television hook-up recently explaining a research program that is being sponsored by an oil company at Rice Institute where he is an associate professor of physics. . . . It's amazing how time flies—we were discussing the possibilities for the location of our 15th Reunion at our meeting. In order to get the very best spot we hope to make a selection in the near future. Either Wally or I will get you addi-

tional information for the class notes on the Alumni Day cocktail party."

Sidney C. Howell, XVI, is the new vice-president in charge of industrial and aviation sales for the Weatherhead Company. In making the announcement, Albert J. Weatherhead, Jr., President, indicated this appointment is part of a program established to direct the company's expanded activity in fluid power products. Howell joined Weatherhead in 1956 and has been closely associated with Weatherhead's continual program of growth in the fluid power industry. Prior to his recent appointment, Howell served the company in various sales and general management assignments. Howell's new responsibilities emphasize the company's important technological progress in meeting exacting standards set forth by the aviation, missile, ground service equipment and vast automotive, industrial, and LP-gas markets which Weatherhead services. His headquarters will be in Cleveland. . . . From the Frigidaire Division of General Motors in Dayton, Ohio, come the news that **Harvey R. Tuck**, II, is a senior engineer, and the inventor of a refrigerating apparatus under patent 2,991,628.—**Frank T. Hulswit**, Secretary, 14 Nadine Road, Saxonville, Mass.

'50

I was able to get up to the Institute during Easter, and I see that while the buildings are sprouting out of the ground we still don't have much more of what has traditionally been our famous Great Green Court. I thought I would report this important fact to you fellows who have not had the opportunity to get back to M.I.T. to check up on our lawn program! I would suggest that you all try to get up there for Alumni Day. If you happen to be on hand and I don't see you, please drop me a note and report on your visit to the Institute. Meanwhile, I am pleased to report some correspondence this month that I can pass on to you. Hope to hear from you all very soon. Here is some current information in the way of a few key facts and statistics on **Lou Stark** and his family. Lou is working for Hughes Ground Systems Group in Fullerton, Calif., as manager of the Microwave Department. Lou and his wife have four children (two boys and two girls) and have just moved into their new house in Fullerton; the address is 2210 Yucca. The house proved to be a real project, taking a year to design and build. Lou and his family are very pleased with Southern California living and working. . . . Appearing in the December, 1961, issue of Aerospace Engineering, on page 20 is an article entitled "Air-Borne with the Curtiss A-1 Replica" by **Donald P. Germeraad**. "As part of the commemoration of the 50th anniversary of naval aviation, a replica of the Curtiss A-1 Hydroaeroplane was built and flown. Donald describes the design and construction of it and his experiences flying this reproduction of the Navy's first plane."

Sam Tenant has been appointed program director of Defense Systems Stud-

ies. Previously, Sam was head of the Orbital Interceptor Program Office. Aerospace Corporation, organized to perform scientific effort in the public interest, serves the U. S. Air Force in scientific-engineering planning and technical direction of space and ballistic missile programs. Areas of study at Defense Systems include: defense against ballistic missiles (including BAMBI orbital interceptor program), defense against potentially hostile satellites, and defense of satellites against hostile action. Sam joined Aerospace Corporation in August, 1961, from Space Technology Laboratories, Inc. At STL he was a senior staff assistant to the vice-president, Ballistic Missile Program Management Division, and was responsible for a number of missile product improvement studies and for technical proposal activities. Before joining STL, Sam was head of dynamics and computation at Temco Aircraft Corporation. Sam and Mrs. Tenant and their three children reside at 405 Via La Soledad, Redondo Beach, Calif. . . . **Marc G. Dreyfus** is projects manager in the Development Engineering Department of Barnes Engineering Company, responsible for the design and development of spectroscopic instruments. Prior to joining Barnes in 1959, he was employed at Librascope, American Optical Company, and Bausch and Lomb. . . . **Jim Bain, Jr.** has the silver oak leaf signifying his new rank of lieutenant colonel. Jim is attending the regular course at the Staff College, the Army's senior tactical school, established in 1881 as the School of Application of Infantry and Cavalry. . . . **George A. Michael**, Director of the Division of Food and Drugs spoke last month on the topic of "Narcotics and the Rehabilitation of Drug Addicts," a true and factual discussion of an extremely controversial social problem. George is an outstanding chemist; he has been with the Massachusetts health department for 22 years.

I have some address changes this month for you that I think will be of interest: **William G. Johnston**, Box 746, Prineville, Ore.; **Anthony L. Julius**, 7622 Alan Parkway, Cleveland 30, Ohio; **James D. Kenney**, 511 Dorchester Road, Akron 20, Ohio; **John G. King**, 51 Upland Road, Brookline 46, Mass.; **Maurice Kunstenaar**, 501 East 79th Street, New York 21, N. Y.; **Albert W. Lange**, Holophane Company, Room 1962, 608 South Dearborn Street, Chicago 5, Ill.; **Joseph S. Lawrence, Jr.**, RD, Annandale, N. J.; **Francis F. Lee**, RD #3, Norristown, Pa.; **Seymour D. Lerner**, 40 Ridge Drive, Plainview, N. Y.; **Roger Manasse**, Lowell Road, Westford, Mass.; **Daniel R. Mason**, 1055 Old Barn Lane, Lake Forest, Ill.; **Carl F. Mellin, Jr.**, 74 Edgell Street, Gardner, Mass.; **Donald R. Miller**, Cresap McCormick and Paget, 342 Madison Avenue, New York 17, N.Y.; **Frank E. Parisi**, 164 Bigelow Road, West Newton 65, Mass.; **Melvin Rabushka**, 705 Chestnut Street, St. Louis 32, Mo.; **John G. Redmon**, 1003 Polaris Drive, Point Mugu, Calif.; **Robert F. Sadowski**, Bushkill Drive, RD #2, Easton, Pa.; **James W. Salassi**, 1905 Westwood Place, Pomona, Calif.; **Asbury H. Sallenger**, 5905 North

Maxwell Court, McLean, Va.; **Stuart D. Shaw**, 180 Pearsall Drive, Mount Vernon, N.Y.; **David W. Sigourney**, 242 Great Road, Acton, Mass.; **Ernest V. Siracusa**, American Embassy, APO 794, New York, N.Y.; **Mrs. R. C. Small**, 106 Crestview Place, Oak Harbor, Mich.; **Francis E. Smith, Jr.**, 18101 West Woodland Court, New Berlin, Wis.; **Richard V. Smith**, Hopp Ground Lane, Bedford Village, N.Y.; **Arthur J. Solari**, 1420 Brooklyn Avenue, Ann Arbor, Mich.; **Robert H. Stebbins**, 59 Tomac Avenue, Old Greenwich, Conn.; **William J. Timson**, 264 Hillside Avenue, Arlington 74, Mass.; **James R. Turner**, Dynatech Corporation, 17 Tudor Street, Cambridge 39, Mass.; **Guntram Weissenberger**, 70 Henry Townsend, Wayne, Pa.; **Earle F. Wheelock**, Western Reserve, School of Medicine, Cleveland 6, Ohio; **Michael K. Wilkinson**, Georgia Institute of Technology, Physics Department, Atlanta, Ga.; **Serge Wisotsky**, 89 Bullard Street, Sharon, Mass.; **William W. Woolford**, 2576 Baldwinne Park Road, Philadelphia, Pa.; **Edward R. Adelson**, 5985 South Crocker Street, Littleton, Colo.; **Robert F. Anderson**, 14 Cranbury Road, Westport, Conn.; **James E. Archer**, Wagner Road, RFD #3, Allison Park, Pa.; **Andrew C. Batten**, RD #1, Box 201, Nathalie, Va.; **James J. Bennett**, Apartment 2, 5504 South Madison, Hinsdale, Ill.; **Richard K. Bennett**, Lincoln Road, South Lincoln, Mass.; **John E. Bent**, 98 Elm Street, Gardner, Mass.; **Robert D. Bissell**, 381 Valleybrook Road, Orange, Conn.; **James R. Butterworth**, 20 Shady Glen Court, New Rochelle, N.Y.; **Norman E. Chrisfield**, 2808 Tremainsville Road, Toledo 12, Ohio; **Sumner Cohen**, 30 Briarfield Lane, Huntington, N.Y.; **Edwin L. Field**, 18 Summer Street, Augusta, Maine. See you soon.—**Gabriel N. Stilian**, Secretary, American Management Association, 1515 Broadway, New York, N. Y.

'51

It is with deep regret that we report here the untimely death of **Jerry Hartstein** on March 2. A victim of Hodgkin's disease, Jerry had been ill for four years although not incapacitated. He is survived by his wife, Pat, and son, David, 4.

. . . **Wallace B. Lebowitz** has opened an office in Bridgeport, Conn., for the treatment of diseases of the heart in adults and children. Prior to opening this practice, Wallace was on the staff for children's heart diseases at the University of Michigan hospital. After M.I.T. Wallace studied at the Boston University School of Medicine, served his internship and residency in internal medicine at Boston City Hospital and the New England Center hospital at the Pratt Diagnostic Clinic. He and his wife, Sylvia, have two children. . . . **William V. Ward** has the distinction of compiling the material included in Volume 1, Number 1 of a publication. The new newsletter is entitled "Rare Earth Research Notes" and is published by Kleber Laboratories, Calif., to which William is a consultant. He is an engineer with Inter-

national Nickel Company. . . . **Donald W. Breck** is a senior research associate with Linde Company, Division of Union Carbide.

Robert J. Bartels moved from Poughkeepsie, N.Y., five years ago to direct the City Planning Department in Hartford. The enthusiastic renewal projects he has spawned were the topic of a recent feature story in a Worcester, Mass., newspaper. . . . **Edward W. Webster** is a physicist with the Massachusetts General Hospital. . . . **Mrs. A. S. Thomas**, who received her Ph.D. with our class, is a physicist on the staff of A. S. Thomas, Inc., a six-year-old firm in Westwood, Mass., which specializes in outer space communications. . . . **Michael Tinkham**, Professor of Physics at Berkeley, authored a recent article in the IBM Journal of Research and Development on "Dependence of the Energy Gap in Superconductors on Position and Magnetic Field."—**Richard W. Willard**, Secretary, Box 105, Littleton, Mass.; **Forest C. Monkman, Jr.**, Assistant Secretary, 46 Lincoln Street, Hingham, Mass.

'53

Big news first! Our 10th Reunion site has been chosen; from all reports it is a perfect spot, down on Nantucket Sound. The specific location is Chatham, Chatham Bars Hotel; the date will be June 7 through June 9. Reserve it now! More later. . . . **Brian** and **Sonia Parker**, now living in Puerto Rico, report the arrival of a daughter. . . . **George Fuld** is happily remarried (to Nancy Morstein), and still working with Fuld Brothers in Baltimore. As he puts it, "I have no title, except boss's son." Business is thriving, and George is productive as usual. He received his first patent in February on waxes; and he is awaiting two others: one, assigned to Hercules Powder on a fermentation process; second, assigned to Fuld Brothers on a multi-color effect for toilet bowl cleaners. That's what I call diversification! In his spare time, he has written two books on coins, one in 1960 titled "Patriotic Civil War Tokens," and another just off the press titled "Guide to Civil War Store Cards." Also, George helped organize the Token and Medal Society last year, and was its first president and editor of its journal.

We finally got the correct information on **Jon Van Winkle**. He's in Schenectady, N.Y., and grinding his way toward a doctorate at R.P.I. He passed his candidacy exam in February and is embarked full time on his thesis. The thesis research is "The Oxygen Electrode Mechanism and Kinetics of a Membrane Fuel Cell." . . . **Jon** hopes to finish up in January, 1963.—**Martin Wohl**, Secretary, Room 1-131, M.I.T., Cambridge, Mass.

'55

John C. Lindenlaub sent us a nice Christmas letter that somehow became lost at the bottom of the file, but better

late than never. He received a Ph.D. in electrical engineering from Purdue last June and spent the summer at Lincoln Lab. The fall brought the family back to West Lafayette, Ind., where John became an assistant professor. The letter was signed by their two boys Brian and Mark, 2 and 3 years respectively—undoubtedly our youngest correspondents. . . . **Marc S. Gross** recently joined the firm of Ostrolenk, Faber, Gerb and Soffen, patent attorneys in New York City. Marc will specialize in the chemical end of the business, though the company is primarily in electronics. He writes of a letter from **Bob Burman** whose wife, Bobbie, had a second son, David, on their second day in Copenhagen on an NSF fellowship. That's cutting it pretty close. Bob received a Ph.D. in physics in November from the University of Illinois. . . . **Eric D. Thompson** has been awarded an NSF fellowship for post doctoral studies in physics at the Atomic Energy Research Institute, Harwell, England. . . . **Don Brennan** published an article entitled "Further Comment on the Feasibility of Nuclear War" in the February, 1962, Federation of American Scientists Newsletter. . . . **Al Glueck** has recently been elevated to the position of manager, chemical engineering, at the Dynatech Corporation in Cambridge. . . . **Sandy Goldman** has joined Aerospace Research, Inc. in Newton, Mass., as group leader in charge of radio propagation research. ARI is becoming a haven for '55ers with **Bob Craven** as group leader, instrumentation, and **Dennis Shapiro**, President.

Talking about presidents, **Harry Schreiber** has set up Data-Service, Inc. in Cambridge providing "centralized electronic data-processing services for business and industry." . . . **Gus Kabelschat** has been elected president of Luzerne County Chapter, Pennsylvania Society of Professional Engineers. A beautifully penned letter from wife Rosemary tells of their wanderings throughout the Northeastern United States and Puerto Rico before settling back home in Pennsylvania four years ago. Gus is with Raymon R. Heddon and Company, general contractors, as general manager. He is also a director of Encon, Inc., a company engaged in engineering and design. They have a daughter Sandy, six, and a beautiful contemporary home in Dallas, Pa. Thanks for the letter, Rosemary; please write again. . . . **Jud** and **Joyce Ball** apologize for not supplying a pretty pink card to tell of Jenifer Ellen, born last June. Jay goes on to tell of his architectural career as follows: "After going around to several of the national parks it put up buildings (including a much photographed visitor center at Wright Brothers National Memorial), we traded in an unused apartment for a house and settled down in an office to practice more quietly—still with the National Park Service. After a Superior Performance Award for some architecturing in Lake Superior (Isle Royale), I was given the Statue of Liberty, a budget, and some paper. We will start construction of the American Museum of Immigration around the base of the statue next spring." . . . **Ed Berg**, President of Contronics, is turning the company into a

thriving electronics operation, congratulations and best wishes. The list of 11 men is quite impressive and includes **Ted Kennedy** among them. . . . **Steve Rau** has been named research and development engineer for Precision Founders, Inc. of San Leandro, Calif. He was previously at the Stanford Research Institute. . . . **Bob Dawson** has accepted an associateship with the consultant firm of Walter J. Douglas Associates. Bob has been involved in numerous projects for Douglas during the past few years including the Yale hockey rink. . . . **Dave Friedman** has been appointed to the staff of Charles W. Greengard Associates, consulting engineers, in Deerfield, Ill. . . . **Walt Maciąg** presented a paper on "State-of-the-Art of Solid State Microwave Transmitters" last November at a Boston IRE meeting. Walt heads the Advanced Microwave Development Group at Sylvania in Waltham.—Co-Secretaries: **Mrs. J. H. Venarde**, 2401 Brae Road, Arden, Wilmington 3, Del.; **L. Dennis Shapiro**, 15 Linnaean Street, Cambridge 38, Mass.

'56

At the March monthly Alumni Council meeting your class was represented by eight members who are interested in keeping up with Alumni affairs; they are able to spend an evening over cocktails and dinner with fellow Alumni. If you would be interested in attending some of these gatherings please contact our council representative, **Warren G. Briggs**, at 90 Revere Street, Boston, Telephone RI2-1741. Start the new Alumni year by attending a fall meeting. . . . Notices for the class include an address change for our co-class agent, **Garry L. Quinn**. Garry now resides at 1902 Rockland Avenue, Rockville, Md. For those who visit the Pacific Northwest, especially the Seattle Fair, our regional secretary is **John T. Coleman**. John's new address is 3500 East John Street, Seattle 2, Wash. Another recent change of address notes that **Robert J. Block** is now at the Ceramics Building, University of Illinois. . . . We just received a note from **Robert S. Carlson**, who announces that he will marry Sandra Stoltz of Houston, Texas, on June 21. Bob is working on his doctorate at the Stanford School of Business. . . . **Marty Chetron** writes from Los Angeles that he, **Don Block**, and **Don Bavly** have formed a Baker House greeting committee. Marty has a second daughter, Nancy Ann, born last September. In October he received his M.B.A. from U.S.C. He is now employed as a staff consultant with George Fry Associates, a management consulting firm. . . . **Mort Cohan** gave a seminar at Tech on March 21 entitled "Non-destructive Determination of Properties of Spent Fuel by Gamma Ray Spectroscopy."

Irwin C. Gross has recently returned to Boston to work with the Wasco Plastics Division of American Cyanamid. . . . **Art Hansen**, who was a project engineer at Metals and Controls Nuclear in Attleboro, returned to Tech last fall to work

on his S.M. in the School of Industrial Management. . . . **Belden A. Idelson** has recently changed his address to Otis AFB, Mass. . . . **Richard I. Johnson** became engaged to Virginia Sarro of Philadelphia in March. . . . **Charles C. Joyce, Jr.**, who worked for MITRE Corporation after his Army tour, is now at the School of Industrial Management studying organizational problems. . . . **John F. Pierce, Jr.** is on a leave of absence from IBM to obtain his doctorate in operations research. John is studying production control in the paper industry. . . . **Wendy A. Reis, Jr.** worked in the operations research section at the School of Industrial Management and then went to Sprague Electric as a special staff assistant. Rumor has it that he was reclaimed by the Army in last fall's callup and is presently at Fort Devens.—**Bruce B. Bredehoft**, Secretary, 1094 Center Street, Newton Center 59, Mass.

'57

While in Oklahoma City recently I visited with **Virgil Browne**. Virgil is with the Fidelity National Bank and is presently working on integrating an IBM 1401 into their operations. I had dinner recently with **Mal Jones**, **Bob Murphy** and **Fred Morefield**. President Kennedy extended Mal's service with the NSA until the end of the year. On a recent trip to the West Coast, Mal saw Dave Bradley, '57, who is working at Convair on the Atlas program, **Jay Schmuecker**, who is at JPL working on the Mariner space probe, and **Frank Ching** in San Francisco. Bob Murphy has accepted a position with Eso International in New York City. Bob was separated from the Air Force in August, 1960, after which he returned to M.I.T. for an M.S. in chemical engineering. . . . John Decker, '58, and his wife, Linda, are back from England where John studied for three years for his Ph.D. in aeronautical engineering. The Deckers are going to Albuquerque, N.M., where John will be assigned to Kirkland AFB as a research officer. . . . **Ron Enstrom** is back at the Institute working for a Ph.D. in metallurgy. Ron received his M.S. in February, 1962.

Art Schultz has accepted a position with West Virginia Pulp and Paper in New York. . . . **John Tiller** has joined Sanders Associates as a field engineer. John was formerly a field engineer with Hughes Aircraft. . . . The Army has caught up with **Bob Berg**, who is currently stationed at U.S. Army Chemical Center, Md. Bob was formerly with the U.S. Rubber Company. . . . **Pete Franklin**, who is employed as an assistant engineer on missile development by Sperry Gyroscope, is currently on a Peace Corps project in Tanganyika. . . . **Andrew F. Kazdin**'s composition, "The Social Beaver Suite," was being performed by the M.I.T. Concert Band on its mid-term tour of northeastern cities and universities. . . . Etta Kappa Nu named **Clarence Baldwin** of Westinghouse Outstanding Young Electrical Engineer of 1961. . . . **Ho-Kang Liu** and Theresa Wu were engaged

last November. Ho-Kang is a design engineer with Monsanto Chemical. **Art Bergles** delivered a talk on "Forced Convection Boiling Heat Transfer" at an Engineering Projects Laboratory Colloquium.—**Alan M. May**, Secretary, 201 East 66th Street, New York 21, N.Y.; **Martin R. Forsberg**, Assistant Secretary, 11 Scottsfield Road, Allston, Mass.

'59

I had dinner with **Dave Woronoff** several nights ago, and he mentioned the possibility of continuing at Yale after receiving his law degree from Boston College this year. To top off a good record at B.C. Law School, Dave and a classmate, Joe Bermingham, will be publishing a student comment in the Boston College Industrial and Commercial Law Review (Volume 3, Spring, 1962). The comment is entitled "Labor Law's New Frontier: The End of the Per Se Rules." Dave also mentioned having gotten several letters from **Mike Brunschwig**. Mike is now working for Bendix in Ann Arbor, Mich., and is driving a TR-4. . . . **Bob Muh** has been keeping in touch pretty regularly. Bob is now in Israel and is intending to spend several months there. . . . A letter from **Kent McDonald** brings us up to date on his activities. After graduation, Ken returned to California to work for Hughes Aircraft Company as a Hughes master's fellow. He received his M.S. degree in June, '61 from U.S.C., and continued working at Hughes Aircraft. He is presently on a field assignment in Pittsfield, Mass. Kent expects to return to California by June. . . . Moving up the executive ladder, **Bud Long** has been appointed assistant to the president of Hoyt Manufacturing Corporation, Westport, Mass. Bud was formerly associated with Texas Instruments in Houston. . . . Over the past few months several '59ers have mentioned that they would like to hear more about what classmates are doing, and where they're doing it. If you've changed jobs, attitudes, or philosophies recently let Bob or me know about it. Most of it can be published.—**Alan V. Oppenheim**, 1200 Commonwealth Avenue, Allston, Mass.

'60

As you've probably noticed, news for our class has been a little sparse, mostly due to lack of information. In the interest of getting more printable news why don't you just take five minutes and drop me a postcard? . . . It was good to hear from **Bob Mullen**, who is presently an instructor in the Quartermaster Engineered Performance Time Standards Course at Fort Lee, Va., where he's stationed with the Army. Graduate courses at the University of Richmond toward an M.B.A. degree are keeping him busy in the evenings, as is the Mullen's year-old son, Brian. Bob also writes that **Ed McCartney** returned from his service in the Corps of Engineers of the Army to work

as a mechanical engineer for Maytag of Newton, Iowa. . . . Other news from the Army—**Earl Pike** was recently assigned to the Army Chemical Corps Materiel Command, in Maryland. . . . **Howard McDowell** completed a seven-week nuclear weapons employment and radiological warfare course at the Chemical Corps School, Fort McClellan, Ala., in December. . . . **Howard Hornfeld** was assigned to the U.S. Army Chemical Center in Maryland in January. He had previously completed the eight-week officer orientation course at Fort McClellan, as had **George Schnabel**. . . . **Ben Harris** will finish Artillery Officers' Basic course at Fort Sill in April and then the Harris' are off for Germany. Ben finished his M.S. in international relations in August at the University of Wisconsin. . . . And from the Navy, **James Duke** was recently promoted to rank of lieutenant (j.g.). He's stationed at the Naval Air Development Centre, Johnsville, Pa., where he's employed on the Condor Missile Project. Jim plans to return to school to study for an M.S. in aeronautical engineering in the fall. . . . **Roger Kiley** enjoyed a 'Wanderjahr,' or at least part of one, before joining the Army in late January. He spent last fall journeying through Europe and the Near East with **Fouad Malouf** of Beirut, Lebanon. They drove an English Landrover some 10,000 miles of the 17,000-mile jaunt which took them to many of the more out of the way places that are not visited by tourists traveling by commercial means. Included in their wanderings were a visit to the Pyramids of Egypt—on Christmas Day—a trip down the Nile from Cairo to visit Luxor and the many tombs and temples. In Damascus they saw the still well-preserved castles erected by the crusaders, and the fabled Cedars of Lebanon. Roger is now stationed with the Ordnance Corps at White Sands Missile Range in New Mexico. . . . Lieutenant Colonel **Francis W. Murray**, USAF, who received his Ph.D. in Course XIX with our class, has recently been awarded the Air Weather Service Merewether Award. Colonel Murray, a meteorological systems analyst, was selected for the award as the person having made the most significant technical contribution to military meteorology during the last year.

In the civilian ranks, **William Thompson** is employed as assistant chief engineer in the Saginaw Steering Gear Division of General Motors. . . . **David Buhl** recently joined the staff of the Electronic Engineering Department in the University of California's Lawrence Radiation Laboratory in Livermore, Calif. . . . **Jack Schoop** is associated with the Cambridge firm of Adams, Howard and Greeley, city planning consultants, and is presently engaged, among other things, in a study of long-range planning for Belmont. Also in city planning, the Reverend **Robert G. Howes** is acting as the "bishop's representative for community relations in the Worcester Catholic diocese," and from local newspaper clippings, we gather that his appeals against corruption in Massachusetts and for zoning ordinances have been pretty stirring. . . . **Dave Aaker** is "still playing the role at Texas Instru-

New Sloan Fellows

YOUNG EXECUTIVES who will begin a year's study of industrial management as Sloan Fellows this month include:

James K. Bakken, Ford Motor Co.; *Walker M. Benning*, Cleerman Machine Tool Corp.; *Robert C. Bitting, Jr.*, R.C.A.; *Roland B. Butterfield, Jr.*, Western Electric Co., Inc.; *John W. A. Buyers*, Bell Telephone Co. of Pa.; *Charles W. Campbell*, American Smelting and Refining Co.; *Colin A. Canhan*, Englehard Industries, Inc.; *Colby H. Chandler*, Eastman Kodak Co.; *Raymond E. Clancy*, Atchison, Topeka and Santa Fe Railway; *Ernest Coleal*, USAF;

Robert H. Cramer, Socony Mobil Oil Co., Inc.; *William E. N. Doty*, Continental Oil Co.; *August Gartner, Jr.*, Illinois Bell Telephone Co.; *Bernard J. Greenblott*, IBM; *Edward C. Gustely*, Aerojet-General Corp.; *Keki R. Hathi*, Godrej & Boyce Mfg. Pte. Ltd.; *Paul A. Heinen*, Chrysler Corp.; *Frank S. Holman*, The Boeing Co.; *Neil S.*

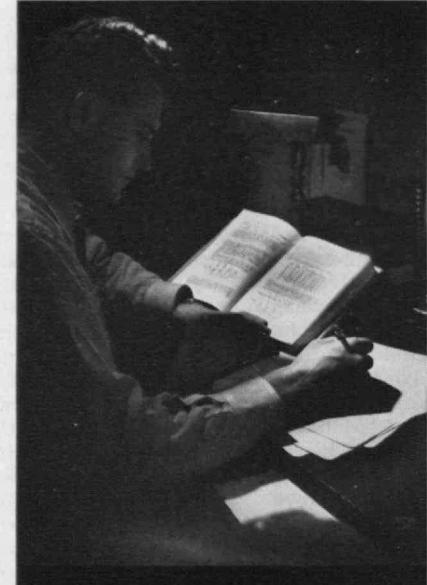
James, Sun Oil Co.; *Thomas G. Johnston*, U.S. Steel Corp.; *William G. Kay, Jr.*, Campbell Soup Co.;

Dean D. Kerr, Kennecott Copper Corp.; *Alfred E. Kugler*, General Motors Corp.; *Merrill H. Mead*, NASA; *Richard V. Nuttall, Jr.*, University of Pittsburgh; *John M. Percival*, Singer Mfg. Co.; *Norman C. Peterson*, Hughes Aircraft Co.; *James L. Powell*, Ohio Power Co.; *Shanti Prakash*, The Delhi Cloth & Genl. Mills Co. Ltd.; *James C. Rendeiro*, Wagner Castings Co.; *Robert H. Schlomann*, '55, American Electric Power Service Corp.;

Melvin C. Seibel, USAF; *Spencer E. Smith*, NASA; *Stanley W. Smith*, Northwestern Bell Telephone Co.; *Carl F. Stuehrk*, A.T.&T.; *Dura W. Sweeney*, IBM; *Alan E. Thomas*, Southern Bell Telephone and Telegraph Co.; *Robert G. Voss*, NASA; *George R. Wachold*, Department of the Navy; *Robert G. Wick*, Kimberly-Clark Corp.; and *Russell C. Youngdahl*, Consumers Power Co.

'61

There is little to report. The Second Century Fund drive in the class is just beginning to gain momentum here in the Boston area. At this writing, we were just beginning to contact non-Boston people. I hope that by now you have all given the matter some thought, and decided what you can do for SCF. See my March column for details on our project within the Fund, the Class of 1961 Lounge. I will try to supply some figures on the drive in my next column, to let you know how things are going. . . . I ran into **John Suhrbier** in the Grad House a while back. He has a research assistantship in the Systems Laboratory in the Civil Engineering Department and is doing work in economic location of highways. . . . Second Lieutenant **Leonard I. Hess** completed the officer orientation course at the Quartermaster School, Fort Lee, Va., on February 9, and a three-week course in maintenance supervision on March 9. . . . Second Lieutenant **Paul H. Fricke** completed the officer orientation course at the Engineer School in Fort Belvoir, Va. Before entering the service on January 1, Paul was with Goodyear, in Akron, Ohio, in the management training program. —**Joseph Harrington 3d**, Secretary, M.I.T. Graduate House, Room 212A, 305 Memorial Drive, Cambridge 39, Mass.



Have you a
Friend
Relative
Business Associate
who would enjoy
Technology Review?

Many young men planning their education read it now. Others who wish they had attended M.I.T. but never did are finding it interesting, too.

You can have nine issues of The Review sent to any address in the United States for \$4, or any address elsewhere in the world for \$4.50. Such one-year subscriptions can begin at any time.

Does your town's library have The Review? Your local high school? Your company's reception room for visitors? And how about your dentist and doctor? Is there anything in their waiting rooms that every patient has not already read somewhere else?

A note and check sent to the Circulation Manager, Technology Review, Room 1-281, M.I.T., Cambridge, may help and inspire someone your country needs.

AN UHDE PROCESS

NITRIC ACID

**Energy Self-sufficient
Package Units**



Further information may be obtained from

HOECHST-UHDE CORPORATION

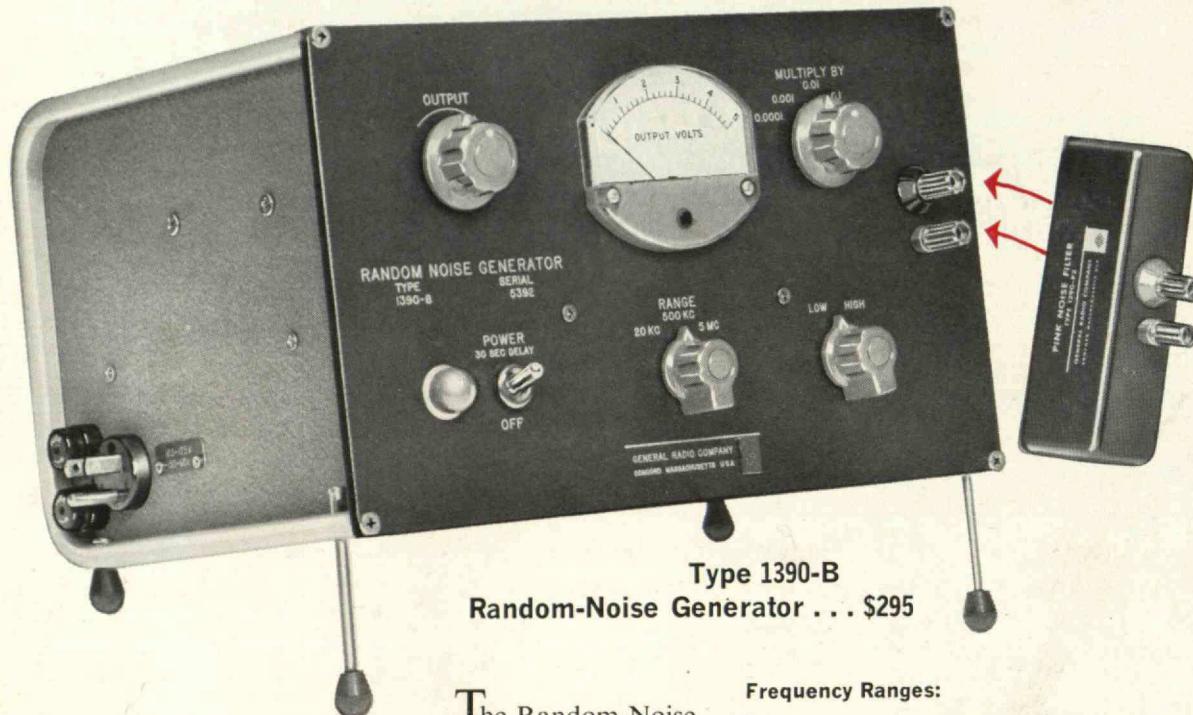
350 Fifth Avenue, New York 1, N. Y.

8204 Empire State Bldg.

CHEMICAL
PROCESSES

PLANT
DESIGN

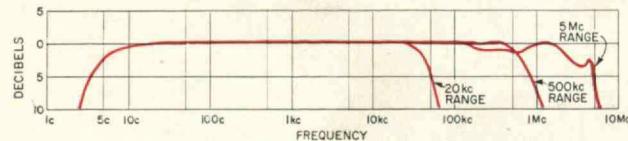
Now—Get Both WHITE and PINK noise from one instrument



The Random-Noise Generator is an excellent wide-range source of frequencies having randomly varying instantaneous amplitudes. Its Gaussian amplitude distribution closely approximates that of speech, music, and natural electrical disturbances. Consequently, the Random-Noise Generator is an ideal noise source for interference measurements, intermodulation and cross-talk tests, reverberation-time studies, driving vibration shakers (with suitable amplification), and random-sampling demonstrations.

The Random-Noise Generator is also capable of providing pink noise with the addition of the new Type 1390-P2 Pink-Noise Filter. The filter has a 3 db-per-octave slope from 20c to 20kc and converts the Generator's output from constant energy per cycle to constant energy per octave. This enables the Generator to be used with constant-percentage-bandwidth analyzers such as the G-R Type 1554-A.

Frequency Ranges:



Output: At least 3v for 20- kc range, 2v for 500- kc range, and 1v for 5- Mc range.

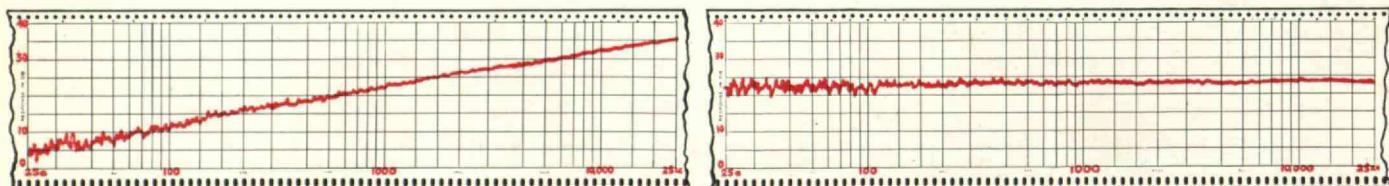
Meter: Averaging meter calibrated to read r-m-s value of noise.

Attenuator: Supplements meter to provide metered outputs from over 3 volts to below 30 μv .

Accessories Supplied: Panel extensions for rack mounting, power cord.

Accessories Available:

Type 1390-P2
Pink-Noise Filter . . . \$45.00.



Noise output versus frequency plots of Type 1390-B Random-Noise Generator without Pink-Noise Filter (left curve) and with Filter (right curve). Measurements were made with the Type 1554-A Sound and Vibration Analyzer, a constant-percentage bandwidth instrument.

Write for Complete Information

GENERAL RADIO COMPANY

WEST CONCORD, MASSACHUSETTS

NEW YORK, Worth 4-2722
District Office in Ridgefield, N. J.
WHitney 3-3140

CHICAGO
Oak Park
Village 8-9400

PHILADELPHIA
Abington
Hancock 4-7419

WASHINGTON, D. C.
Silver Spring
JUniper 5-1088

SYRACUSE
Syracuse
GLenview 4-9323

SAN FRANCISCO
Los Altos
WHitecliff 8-8233

LOS ANGELES
Los Angeles
Hollywood 9-6201

ORLANDO, FLA.
Orlando
GArden 5-4671

IN CANADA
Toronto
CHerry 6-2171